

Tennessee Department of Environment and Conservation

DOE Oversight Division



Status Report to the Public

Fiscal Year 2002

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Contents

TERMS & ACRONYMS	2
EXECUTIVE SUMMARY	3
1.0 INTRODUCTION	6
2.0 JURISDICTION	8
3.0 ENVIRONMENTAL MANAGEMENT	12
4.0 REGIONAL ENVIRONMENT	29
5.0 KEY CHALLENGES	46
6.0 HEALTH STUDIES & EMERGENCY RESPONSE	48
7.0 OUTREACH	52
APPENDIX	57

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Terms & Acronyms

ATSDR	Agency for Toxic Substances and Disease Registry	FY	Fiscal Year
BMAP	Biological Monitoring and Abatement Program	HFIR	High-Flux Isotope Reactor
CAP	Oak Ridge Reservation Local Oversight Committee Citizens' Advisory Panel	LLW	Low-Level Radioactive Waste
CDC	Centers for Disease Control and Prevention	LOC	Oak Ridge Reservation Local Oversight Committee, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980	MSRE	Molten Salt Reactor Experiment
CROET	Community Reuse Organization of East Tennessee	NEPA	National Environmental Policy Act of 1969
D&D	Decontamination and Decommissioning	NRDA	Natural Resources Damage Assessment
DOE	U.S. Department of Energy	ORNL	Oak Ridge National Laboratory
EA	Environmental Assessment	ORR	Oak Ridge Reservation
EIS	Environmental Impact Statement	ORSSAB	Oak Ridge Site Specific Advisory Board
EMWMF	Environmental Management Waste Management Facility	PCB	Polychlorinated Biphenyl
EPA	U.S. Environmental Protection Agency	RCRA	Resource Conservation and Recovery Act of 1976
EQAB	City of Oak Ridge Environmental Quality Advisory Board	ROD	Record of Decision
ERAMS	Environmental Radiation Ambient Monitoring System	SNF	Spent Nuclear Fuel
ETTP	East Tennessee Technology Park	SNS	Spallation Neutron Source
FFA	Oak Ridge Federal Facility Agreement	SWSA	Solid Waste Storage Area
FONSI	Finding of No Significant Impact	TDEC	Tennessee Department of Environment and Conservation
		TEMA	Tennessee Emergency Management Agency
		TSCA	Toxic Substances Control Act of 1976
		TWRA	Tennessee Wildlife Resources Agency
		UF6	Uranium Hexafluoride
		WAG	Waste Area Grouping

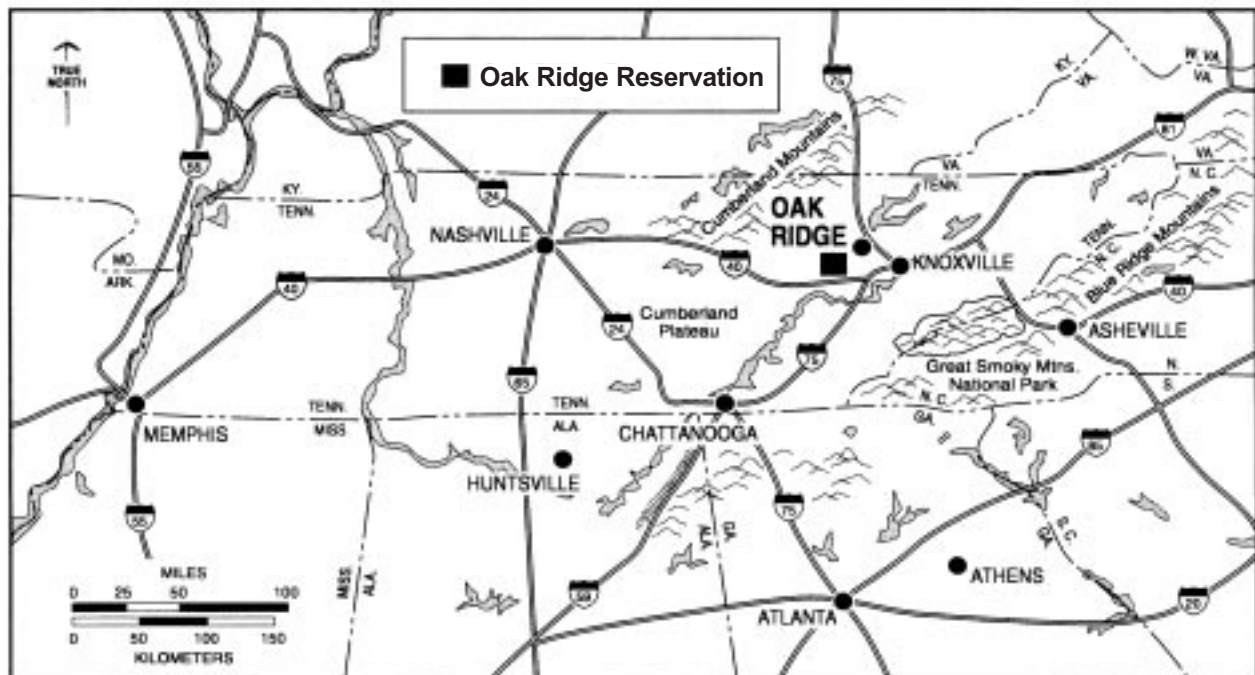
Executive Summary

BACKGROUND

The United States Department of Energy (DOE) has left a legacy of contamination on the Oak Ridge Reservation (ORR), beginning in 1942 with the World War II Manhattan Project and subsequent formation of the secret Clinton Engineering Works.

Four military plants were built in great haste on the massive ORR to create materials for nuclear weapons; these plants were given the code names S-50, K-25, Y-12, and X-10. S-50, a uranium enrichment facility that used a thermal process, was operated for about a year and immediately dismantled. K-25 and Y-12 also enriched uranium, K-25 using gaseous diffusion and Y-12 using electromagnetic separation. X-10 developed technology to produce plutonium. K-25, Y-12, and X-10 still exist as East Tennessee Technology Park, the Y-12 National Security Complex, and Oak Ridge National Laboratory, respectively. During the Cold War, these facilities played a key role in maintaining materials and components for nuclear weapons and in preserving a technological lead over the Soviet Union.

Over the last 60 years, DOE and agencies that preceded it contaminated more than 500 sites on or near the 35,545-acre ORR, with contaminated areas making up about 15 percent of the reservation's total area. This contamination is being cleaned up to



The Oak Ridge Reservation is located in East Tennessee. Map courtesy of U.S. Department of Energy (Oak Ridge Reservation Annual Site Environmental Report for 1998, DOE/ORO/2091).

Executive Summary

levels that comply with current environmental laws, particularly the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Indeed, much of the DOE mission now centers on environmental management.

SCOPE OF THIS STATUS REPORT

The Tennessee Department of Environment and Conservation (TDEC) DOE Oversight Division (the “division”) performs independent monitoring and oversight of DOE’s cleanup and waste-management actions under the Tennessee Oversight Agreement. This status report summarizes the state of Tennessee’s interpretation of federal clean-up progress relating to the ORR. The results of state monitoring and analysis are also evaluated, as are the quality and effectiveness of DOE environmental monitoring and surveillance programs.

MAJOR FINDINGS

Even though several high-risk cleanup projects have been completed on the ORR, massive cleanups remain to be done. The recent signing of major CERCLA Records of Decision has set the stage for 8 to 10 years of remediation.

DOE has undertaken an accelerated cleanup plan designed to bring sites to final closure on a more aggressive timetable than originally planned.

During state Fiscal Year 2002 the division found no immediate threats to public health from current activities on the ORR. DOE must continue to properly control the dangerous materials and wastes managed on the ORR, in particular uranium hexafluoride, highly enriched uranium, mercury, metallic lithium, uranium-233, and spent nuclear fuel.

DOE has undertaken an accelerated cleanup plan designed to bring sites to final closure on a more aggressive timetable than originally planned. The division agreed to the accelerated cleanup plan because the plan addresses the highest-risk sites earlier than previously agreed. However, if cleanups fail to progress as promised or if DOE is unable to provide suffi-

cient surveillance or maintenance, the potential for harm to the public or the environment would increase.

In past years, cleanup progress has been retarded because DOE was unable to dispose of resulting wastes. This problem was alleviated in the last year with the opening of an on-site mixed-waste landfill, which allowed several projects to begin disposing of wastes in a timely manner. This landfill, known as the CERCLA waste facility or the Environmental Management Waste Management Facility (EMWMF), promises to allow faster cleanups with a lower cost for waste disposal. DOE must, however, demonstrate to the state an ability to manage this facility appropriately to ensure that wastes remain isolated from the environment.

Executive Summary

KEY ISSUES AND CHALLENGES

The past year was marked by a massive reorganization of Oak Ridge's cleanup effort, sparked by a top-to-bottom review by DOE Headquarters of site office activities. The accelerated cleanup plan that emerged from this review re-focused remediation activities on the highest-risk sites. To implement the plan, DOE renegotiated agreements with the state and the U.S. Environmental Protection Agency (EPA) regarding the sequence and timing of site cleanups. Annual appropriations from Congress are a key indicator of the federal government's commitment to meeting its responsibility for environmental remediation. It remains to be seen whether DOE can maintain the level of funding necessary to ensure the promised high rate of progress or whether this effort will falter and funding will drop back to previous levels.



TDEC photo

The former K-25 site, now called East Tennessee Technology Park, can be seen from State Highway 58.

Other major issues, some intrinsic to the accelerated cleanup plan, remain to be addressed by DOE. The division has identified the following as key areas of concern:

- Developing appropriate strategies for managing groundwater contamination, a key issue not addressed in recent Records of Decision.
- Ensuring perpetual funding for stewardship of remediated sites and closed disposal areas to preserve their isolation from the public essentially forever.
- Characterizing wastes to ensure acceptance at the EMWMF or the appropriate off-site disposal facility.

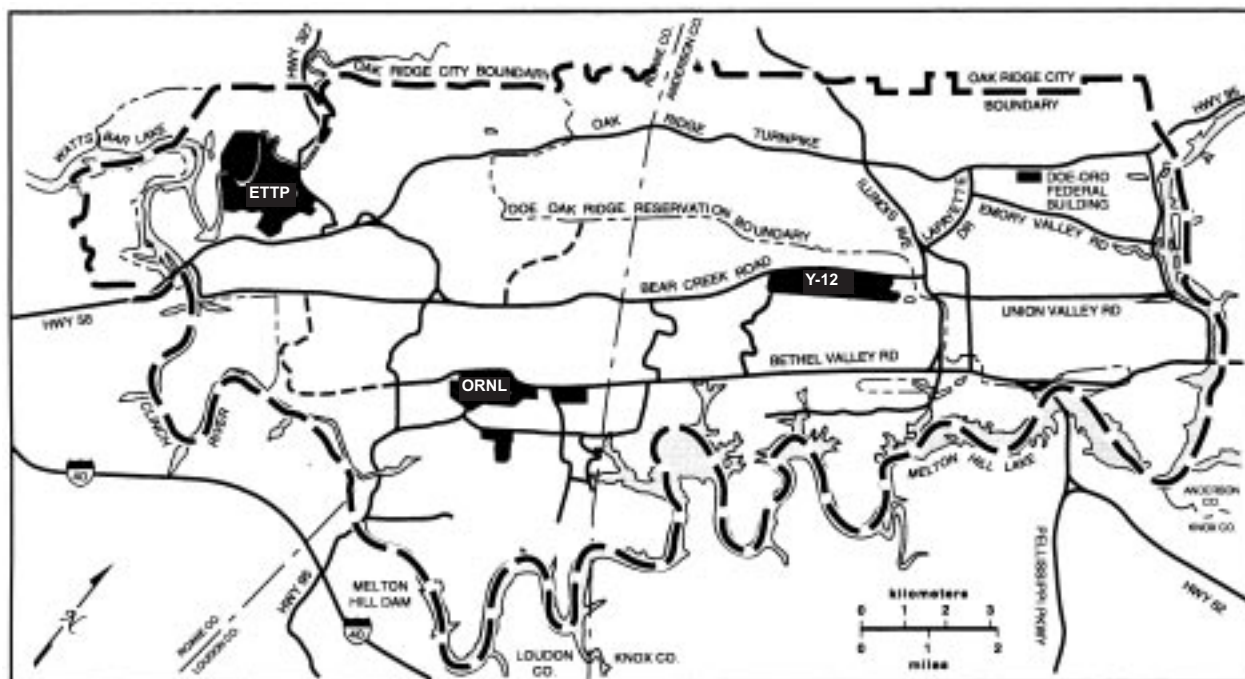
1.0 Introduction

1.1 HISTORICAL SETTING

Oak Ridge is host to three major industrial complexes remaining from the Manhattan Project—Y-12, K-25 and X-10. These facilities have different missions from those originally envisioned, although they continue to produce radioactive and hazardous wastes that demand appropriate management and to discharge small amounts of these substances into the environment under state permits.

During World War II, Y-12 enriched uranium using an electromagnetic process; this process turned out to be relatively inefficient and was abandoned in favor of gaseous diffusion. Y-12 then became the center for precision machining of special nuclear materials for bomb manufacturing. Now, in addition to its defense mission, Y-12 disassembles nuclear weapons and stores highly enriched uranium. It has also been designated the National Prototype Center in recognition of the unique expertise of its machinists.

K-25 was the first gaseous diffusion plant and gave its name to the industrial complex that sprang up around it. This complex is now called Horizon Center at East Tennessee Technology Park (ETTP). The facility ceased producing enriched uranium in the 1980s. Its current goal is to complete the cleanup necessary to convert the property into a



The Oak Ridge Reservation lies about 20 miles west of Knoxville and straddles Roane and Anderson Counties. Map courtesy of U.S. Department of Energy (Oak Ridge Reservation Annual Site Environmental Report for 1998, DOE/ORO/2091).

1.0 Introduction

private-sector industrial park, a process known as “reindustrialization.” ETTP also houses the Toxic Substances Control Act of 1976 (TSCA) Incinerator, the nation’s only facility permitted to incinerate radioactive waste with hazardous waste containing polychlorinated biphenyls (PCBs).

X-10, later known as Oak Ridge National Laboratory (ORNL), pursued weapons research and development, especially in the purification of plutonium. Today, ORNL conducts research in a wide variety of scientific fields; it is widely known for its contributions to neutron science and will host the Spallation Neutron Source, a major research facility now under construction.

The story of Oak Ridge and details of the environmental damage are given in a community publication, “Oak Ridge, Tennessee: A Citizen’s Guide to the Environment.” This publication is available from the Oak Ridge Chamber of Commerce, or it can be downloaded from the following web sites: <<http://www.local-oversight.org/>>, <<http://www.eteba.org/>> <<http://www.orcc.org/intro.html>>, and <<http://www.eteonline.org/>>.

Details are given in a community publication, “Oak Ridge, Tennessee: A Citizen’s Guide to the Environment.”

1.2 DIVISION OBJECTIVES

The Tennessee Department of Environment and Conservation’s (TDEC’s) U.S. Department of Energy (DOE) Oversight Division (“the division”) pursues five primary objectives:

- To evaluate and promote DOE compliance with applicable laws, regulations, Federal Facility Agreement (FFA) provisions, Tennessee Oversight Agreement requirements, DOE Orders, administrative policies, approved procedures, and appropriate guidelines;
- To assess the effectiveness of radiological controls implemented on the Oak Ridge Reservation (ORR) by DOE and its contractors;
- To characterize and identify radiological and other contaminants on the ORR and environs and to determine the potential impact of DOE activities on the welfare of Tennessee’s citizens and environment;
- To support DOE in employing the corrective measures necessary to provide a healthful environment for the citizens of the state;
- To maintain performance under conditions of emergency response and provide requested services to the Tennessee Emergency Management Agency as described in its multi-jurisdictional response plan for the ORR.

The results of these activities and the current status of environmental health on the ORR are summarized in this report.

2.0 Jurisdiction

ENVIRONMENTAL LAWS

Comprehensive Environmental Response, Compensation, and Liability Act of 1980

Commonly known as “Superfund,” CERCLA was enacted in 1980. It establishes a trust fund for cleaning up abandoned or uncontrolled hazardous waste sites. It also sets up rules governing these sites and holding those responsible for the contamination liable.

CERCLA lays out the steps through which DOE must proceed in cleanup planning under its environmental restoration program. The “CERCLA process” guides DOE through seven clearly defined steps:

- Planning,
- Investigation,
- Feasibility analysis,
- Development of alternatives,
- Public participation,
- Selection of alternatives, and
- Creation of a final, legal decision embodied in a document known as a Record of Decision (ROD).

The ROD is a key milestone in CERCLA decisions because it establishes the legal and technical

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2.1 TENNESSEE OVERSIGHT AGREEMENT AND THE DOE OVERSIGHT DIVISION

The state and DOE signed the Tennessee Oversight Agreement in 1991. TDEC created the division the same year to carry out its responsibilities under the agreement. The Tennessee Oversight Agreement provides a framework and funding for the state to move forward in four areas:

- A regulatory program to support state participation in the FFA (see Section 2.2 below),
- A non-regulatory program of independent environmental monitoring and oversight to supplement activities conducted under applicable environmental laws and regulations,
- An emergency response program to help ensure that the state and local communities are prepared in case DOE creates an off-site emergency, and
- An outreach program to increase public awareness and involvement by local governments and communities in DOE operations in Oak Ridge.

2.2 FEDERAL FACILITY AGREEMENT

The state, DOE, and the U.S. Environmental Protection Agency (EPA) signed the FFA in 1992. The FFA ensures that the division will place emphasis on cleaning up contamination from past DOE activities. Oak Ridge has an FFA because the ORR is listed on the National Priorities List of the Comprehensive Environmental Responses, Compensation, and Liability Act of 1980 (CERCLA).

The division coordinates state activities under the agreement. The agreement itself outlines a procedure for cleanup on the reservation, including the identification of problems, scheduling of activities, and implementation and monitoring of appropriate responses. Actions taken under the FFA conform to CERCLA, the Resource Conservation and Recovery Act of 1976 (RCRA), and other federal and state laws.

2.0 Jurisdiction

CERCLA documents related to cleanup decisions on the ORR are available for the public to review at DOE's Information Center (see Section 7.4.4).

2.3 NATIONAL ENVIRONMENTAL POLICY ACT

The division's NEPA Section reviews NEPA documents that pertain to DOE activities on the ORR. The division comments on these documents to help ensure that DOE decisions provide the widest range of beneficial uses with the least degradation to the environment or risk to health and safety.

The division comments on NEPA documents for DOE's Oak Ridge Operations, which includes the gaseous diffusion plants at Paducah, Kentucky, and Portsmouth, Ohio. The division commented on the following NEPA documents in fiscal year (FY) 2002:

- Final Site-Wide Environmental Impact Statement (EIS) for the Oak Ridge Y-12 National Security Complex. A Record of Decision (ROD) was issued by DOE's National Nuclear Security Administration in March 2002. DOE decided to implement the preferred alternative, which is Alternative 4 [No Action—Planning Basis Operations plus Construct and Operate a Highly Enriched Uranium Materials Facility and Special Materials Complex]. Y-12 will continue its mission of stockpile stewardship while modernizing. This includes building a new facility to house highly enriched uranium. This uranium is now stored in a variety of very old deteriorating buildings.
- Draft Environmental Assessment (EA): The conveyance of the American Museum of Science and Energy, Parcel G, and Parcel 279.01 to the city of Oak Ridge, Tennessee. This EA is anticipated to be finalized in May 2003, to complete the NEPA process. These properties are not contaminated.
- Environmental Assessment Addendum and Mitigation Action Plan for the Proposed Transfer of Parcel ED-1 to the Community Reuse Organization of East Tennessee (CROET). A Finding of No Significant Impact (FONSI) was signed on April 2, 2003. The FONSI, final EA Addendum, and Mitigation Action Plan have been distributed to the public.

Environmental Laws

Continued from previous page

requirements for a given cleanup. Once the state and EPA have signed a ROD, DOE is responsible for carrying out the actions outlined in the document. The ROD, and cleanup actions taken under it, are designed to ensure that all unacceptable risks to human health and the environment are eliminated or controlled as much as possible.

The state is responsible under the FFA for coordinating, reviewing, commenting on, and approving each phase of the CERCLA cleanup. The phases include remedial investigations, feasibility studies, RODs, remedial designs, remedial actions, and follow-up evaluations. These phases are present to ensure success of the cleanup. The FFA involves the state directly in program management, dispute resolution, project prioritization, and milestone scheduling.

Resource Conservation and Recovery Act of 1976

This law gives EPA authority to control hazardous waste from “cradle to grave.” It covers the generation, transportation, treatment, storage, and disposal of hazardous waste. It also provides a framework for managing non-hazardous wastes. RCRA focuses only on active and future facilities.

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2.0 Jurisdiction

Environmental Laws

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DOE's waste management program must answer to the state's delegated authority under RCRA. The division does not enforce RCRA regulations, but it can and does document violations, which are then dealt with by TDEC's Division of Solid Waste Management.

National Environmental Policy Act of 1976

NEPA is the basic national charter for protection of the environment. It establishes policy, sets goals, and provides means for carrying out the policy. NEPA requires DOE and other federal agencies to provide public officials and citizens with environmental information for proposed federal actions that could affect the quality of the environment. With regard to major decisions regarding CERCLA activities, DOE has incorporated "NEPA values," including public participation and broad assessment of possible impacts, into the CERCLA process. The division's NEPA program reviews NEPA documents that pertain to DOE activities on the ORR.

Natural Resources Damage Assessment

The division also participates in Natural Resources Damage Assessment activities. Federal law authorizes this program, which gives natural resource trustees at the state

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- Programmatic Environmental Assessment for the U.S. Department of Energy, Oak Ridge Operations' Implementation of a Comprehensive Management Program for the storage, transportation, and disposition of potentially reusable uranium materials. The FONSI was signed on October 16, 2002.

NEPA requires decisions to be made through a sustained process of inquiry, analysis, and learning. It ensures that federal agencies provide the public an opportunity to learn about and comment on significant proposals. When followed as required, it ensures adequate planning and prevents costly mistakes.

NEPA documents related to federal decisions affecting the ORR are available for the public to review at DOE's Information Center (see Section 7.4.4).

2.4 OTHER PLANNING AND POLICY ISSUES

The division also reviewed and commented on a variety of planning and policy documents, including the following:

- Draft Land Use Technical Report;
- The Oak Ridge Reservation Annual Site Environmental Report; and
- The Environmental Monitoring Plan for the Oak Ridge Reservation.

2.0 Jurisdiction

Environmental Laws

Continued from previous page

and federal level a means of recovering environmental damages caused by releases from CERCLA sites. Specifically, the program is intended to address damages that cannot be effectively corrected through cleanup.

As of this writing, the state has negotiated with DOE regarding compensation for natural resources damages for Lower Watts Bar Reservoir. The negotiations have resulted in a partial settlement in the form of a permanent conservation easement on approximately 3000 acres of undeveloped ORR lands north of Horizon Center at ETTP.

Other Laws

Other laws applicable to environmental management at the ORR include the following:

- Clean Air Act (1970)
- Clean Water Act (1977)
- Emergency Planning and Community Right-to-Know Act (1986)
- Federal Hazardous Substance Act (1966)
- Federal Facility Compliance Act (1992)
- Safe Dam Act (1973)
- Safe Drinking Water Act (1974)
- Solid Waste Disposal Act (1965)
- Toxic Substances Control Act (1976).

3.0 Environmental Management

3.1 RECENT PROGRESS

3.1.1 Environmental Restoration

FY 2002 was a fruitful year for the Environmental Restoration Program at Oak Ridge. This translates into a busy year for the division's Environmental Restoration Program. Many projects that have been in the investigation stages for the past several years had CERCLA RODs signed this year. These projects have now moved into the active remediation phases. Further, many projects that were under way over the past fiscal year have made significant progress toward completion, with some projects being finished during this time.

Over the past decade much environmental cleanup under CERCLA has been accomplished at Oak Ridge. Many of these projects have been very complicated, like the remediation of the gunite tanks at Oak Ridge National Laboratory and the excavation and disposal of mercury-contaminated soils in the East Fork Poplar Creek floodplain. Even though several of the most difficult projects with potential for public exposure have been completed, massive cleanups remain to be done. After many years of extensive investigation and very complex decision processes, DOE's Oak Ridge Operations is moving into a period of long-term active cleanup. The recent signing of major CERCLA RODs has set the stage for 8 to 10 years of fieldwork. The work to be accomplished under these decisions will not end the need for further CERCLA decisions and cleanup at Oak Ridge. It will however, significantly shift resources toward fieldwork and active project oversight, with less emphasis on document preparation and reviews.

There have been two noteworthy events this past year above and beyond the completion of significant CERCLA decisions. First, the CERCLA waste disposal facility, commonly known as the Environmental Management Waste Management Facility (EMWMF), is now active and receiving waste from on-site CERCLA cleanup projects. This facility, officially opened in June, helps significantly in the expedient and effective cleanup of contaminated soils, burial grounds, and facilities at Oak Ridge. The second and more recent event is the completion of an agreement between DOE, EPA Region 4, and the state to significantly accelerate the Oak Ridge cleanup program. The agreement foresees the program completing the closure of East Tennessee Technology Park and the cleanup plan for Melton Valley waste areas by 2008. The plan also calls for all Oak Ridge historical waste being disposed of and CERCLA cleanup being completed by 2016. If this plan is successful, it is estimated to reduce costs by more than \$2 billion and accelerate completion of the Environmental Management Program by 5 years.

3.1.2 Accelerated Cleanup Plan

In FY 2002, DOE unveiled an accelerated cleanup plan designed to reduce costs and speed remediation of the most problematic sites on the ORR. Under this plan, cleanup

3.0 Environmental Management

areas have been reprioritized and the Environmental Management Program reorganized. The division agreed to the accelerated cleanup plan because the plan addresses the highest-risk sites earlier than previous FFA milestones.

Under the accelerated plan, reservation cleanup, formerly grouped together by watershed (detailed in Sections 3.2 through 3.4), has been regrouped into three major categories based on risk and priority. DOE and its contractor Bechtel Jacobs Company LLC have reorganized their staff structures to better address the new project groupings. Most major remediation actions are planned for completion by 2008. Some long-term activities will continue until 2015.

The division agreed to the accelerated cleanup plan because the plan addresses the highest-risk sites earlier.

Melton Valley Closure Project. The Melton Valley Closure Project includes most of the sites grouped in the Melton Valley portion of White Oak Creek Watershed and a few projects from Bethel Valley (Section 3.2).

East Tennessee Technology Park Closure Project. The ETTP Closure Project will concentrate on extensive decontamination and decommissioning (D&D) of the massive gaseous diffusion buildings and their support facilities, allowing cleanup of underlying soils. All actions under the ETTP Watershed (Section 3.4) will be part of this project.

Balance of Program Closure Project. The Balance of Program includes remediation at Y-12 (see Section 3.3), which encompasses both the Upper East Fork Poplar Creek and Bear Creek Valley watersheds, actions at Oak Ridge National Laboratory (Section 3.2) in the Bethel Valley portion of White Oak Creek Watershed, off-site closures at sites in Oak Ridge and Knoxville, and waste management activities (Section 3.5).

3.2 OAK RIDGE NATIONAL LABORATORY

3.2.1 White Oak Creek Watershed—Bethel Valley

The 800-acre Bethel Valley Watershed contains the main plant area of ORNL. The watershed is bounded to the south by the White Oak Creek Watershed—Melton Valley and to the north by the Bear Creek Valley Watershed.

This watershed contains the area known as Waste Area Grouping (WAG) 1: industrial buildings, laboratories, research reactors, and support facilities such as tank systems, pipelines, and other ancillary equipment. The wastes located in the Bethel Valley portion of the watershed came from operations such as the following:

- nuclear reactors;
- radioisotope operations;

3.0 Environmental Management

- particle accelerators;
- hot cell operations;
- physical, chemical, and biological research;
- fuel chemical reprocessing research; and
- analytical laboratories.

Bethel Valley Watershed also contains the WAG 3 Burial Grounds to the west and the WAG 17 Shop Area. WAG 3 and WAG 17 are not as seriously contaminated as other areas but still must be closed out.

Bethel Valley Interim Record of Decision. The Bethel Valley Interim ROD was completed and signed by the FFA parties in May 2002. This ROD covers cleanup of surface water, soils, buildings, and contaminated source areas, while deferring decisions on groundwater to a later date. The signing of this ROD is a milestone and begins several years of CERCLA remediation within the Bethel Valley Watershed.

Signing of the Bethel Valley ROD begins several years of cleanup within the watershed.

Gunite Tanks. The Gunite Tanks at ORNL were built in 1943 to hold wastes from the Oak Ridge Graphite Reactor and related chemical processing activities. Most of these wastes were removed in the early 1980s, but more than 300,000 gallons of highly radioactive liquid and sludge remained in the tanks for many years.

CERCLA activities on the ORNL Gunite Tanks project were completed in 2002. After the radioactive sludge and liquids were removed from the tanks in September 2000, a separate CERCLA project stabilized the tanks in place through the injection of a grouting mixture into the tanks. This activity completes a long-term CERCLA process that began in 1994.

Metal Recovery Facility. The Metal Recovery Facility was a one-story, metal-sided building that was used as an experimental nuclear reprocessing plant between 1952 and 1960. This deteriorating and contaminated structure, located in the main plant area, was demolished this past year. Waste generated from demolition of the facility was shipped to Envirocare of Utah for disposal.

The Molten Salt Reactor Experiment. The Molten Salt Reactor Experiment (MSRE) operated from 1965 to 1969 and was mothballed after it was shut down. The remediation and closure of the MSRE facility is still under way. This activity, authorized under a CERCLA ROD, involves the removal and disposition of reactor fuels (solidified salts of uranium fluoride and small amounts of plutonium fluoride). This material is scheduled to be removed by FY 2004.

The following MSRE activities, overseen by the division's Environmental Restoration and Radiological Monitoring and Oversight programs, have taken place in FY 2002:

3.0 Environmental Management

- **Reactive Gas Removal.** DOE initiated this action to purge uranium hexafluoride (UF₆) and fluorine gas from the off-gas piping system. To date, the Reactive Gas Removal System has removed more than 61 percent of the UF₆. This system will remain operational for the duration of the MSRE remediation project.
- **Uranium Deposit Removal.** The uranium deposit, which was removed in FY 2001 from the auxiliary charcoal bed, consisted of approximately 2.7 kg of uranium-233. The Removal Action Report for this activity was completed and approved in FY 2002.
- **Fuel and Flush Salt Removal.** This remedial action addresses removal of the fuel and flush salts from the drain tanks, separating out the uranium, converting the uranium to an oxide form, storing the oxide as part of the uranium-233 repository inventory, and stabilizing and storing the residual salt. DOE, however, is proposing to dispose of all the uranium-233 removed from MSRE rather than converting the material to an oxide. If this path is chosen, the Record of Decision for Interim Action to Remove Fuel and Flush Salts from the MSRE, the Work Plan for the Conversion of Uranium-Containing Materials Removed from the Molten Salt Reactor, and other applicable documents will require amending.

The schedule for the above activities has been delayed; therefore, the completion of the MSRE Remedial Action Report (now being called the Phased Construction Completion Report) has been delayed to FY 2004.

ORNL Corehole 8 Source Removal. This site is a plume of groundwater contaminated with strontium-90. The contamination can be traced back to highly contaminated soils and a leaking liquid low-level radioactive waste tank located in the main ORNL plant area. The division's Environmental Restoration Program is overseeing this cleanup. After excavation of approximately 90% of the contaminated soil around leaking underground waste tank W-1A, DOE has discontinued the excavation activities. The project was delayed when excavation encountered higher-than-anticipated levels of transuranic radionuclides. The state and EPA have agreed that DOE can re-evaluate the excavation and handling process and continue with removal after the evaluation is complete. DOE has agreed to the resumption and completion of this removal activity in FY 2005.

Main Plant Low-Level Liquid Waste Tanks. When the ORR Federal Facility Agreement was written, an entire section was devoted to the remediation of 26 inactive liquid low-level radioactive waste (LLW) tanks at the ORNL. Activities to clean the tanks and remove or grout them have been under way over the past decade. Remediation is now complete for all the inactive liquid LLW tanks in the main plant. Three tanks containing transuranic waste resins remain within the Melton Valley Watershed area. These tanks are scheduled for remediation as part of the Bethel Valley ROD and will be completed in FY 2004.

3.0 Environmental Management

Surface Impoundments Operable Unit. CERCLA activities to remove contaminated sludge from two large impoundments located at ORNL are well under way. The impoundments were used beginning in the 1940s to settle out untreated wastewater from laboratory operations prior to release of the water to White Oak Creek. To date, approximately 400 bricks of solidified sludge have been generated and await disposal at the Nevada Test Site. A recent rule under TSCA, known as the “Mega Rule,” has complicated the disposal issues for waste contaminated with PCBs. Despite the disposal complications, DOE remains confident that the project will be completed in FY 2003.

Spallation Neutron Source. The Spallation Neutron Source (SNS) is an accelerator-based research facility being built on a 75-acre site on Chestnut Ridge between ORNL and Y-12. Construction of the \$1.4 billion facility began in December 1999, and it is scheduled for completion in 2006.



TDEC photo

The division conducts periodic inspections of erosion and sediment controls at the Spallation Neutron Source site. This photos shows the linear accelerator under construction.

TDEC has established a multidisciplinary team under the division's Radiological Monitoring and Oversight Section to review planning and construction of the SNS. The team also examines waste management issues. Emphasis has been placed on radiological concerns, preservation of groundwater, and the protection of streams and threatened and endangered species.

Team members and other division staff conducted several general site visits during FY 2002 to observe construction progress. A substantial amount of concrete was poured for the linear accelerator tunnel, the ring tunnel, the target building, and several of the support buildings. Staff also participated in several SNS meetings on various topics. In addition to the main SNS construction site, staff conducted several field trips to the SNS shield block storage facility, located on the ORNL 1554 Site, and noted deficiencies to the DOE contractor that later were corrected.

3.2.2 White Oak Creek Watershed–Melton Valley

The White Oak Creek Watershed–Melton Valley occupies about 1,000 acres of land south of and downstream of the Bethel Valley portion of the White Oak Creek Watershed. Haw Ridge separates Melton Valley from Bethel Valley. The Clinch River borders Melton Valley on the west.

Melton Valley contains many acres of burial grounds, seepage pits, contaminated floodplains, and hydrofracture wastes, but the majority of disposal activities involved

3.0 Environmental Management

the use of shallow land burial. The wastes located in this watershed originated not only from local operations, but from other sites as well. Beginning in the mid-1950s, the Atomic Energy Commission designated ORNL's solid waste storage areas as the Southern Regional Burial Grounds. From 1955 to 1963, various off-site installations sent about 10 million cubic feet of solid waste containing radioactive and hazardous substances to be disposed of in this area.

The Melton Valley Watershed has been divided into nine major areas of contamination: WAGs 2, 4, 5, 6, 7, 8, 9, 10 and 13. Problematic contaminants, many of which are discharging into the Clinch River via White Oak Creek, include cesium-137, cobalt-60, strontium-90, tritium, other radionuclides, TRU elements, and volatile organic compounds.

Melton Valley Watershed Interim Record of Decision. The Melton Valley Interim ROD was completed and signed by the FFA parties in September 2000. This CERCLA decision combines all the waste units in Melton Valley into one ROD and consists of many independent subunits or operable units that involve soil excavations, the capping of waste disposal sites, demolition of old facilities, and the plugging and abandonment of numerous monitoring and hydrofracture wells. Under the accelerated cleanup plan, remedial actions to be performed under this ROD are scheduled to be completed in FY 2008. Many activities under this ROD were initiated this past year.

Intermediate Holding Pond Excavation. Solid Waste Storage Area (SWSA) 4 encompasses an area of approximately 33 acres within the Melton Valley Watershed. Adjacent to the mixed waste burial ground, liquid radioactive waste was pumped into the Intermediate Holding Pond after initial treatment to allow the hottest radioactive components to decay. From the holding pond, this waste then flowed down White Oak Creek from Bethel Valley. Excavation activities have begun to remove contaminated sediments from the Intermediate Holding Pond. The remedial action project will remove approximately 19,000 cubic yards of radioactive sediments and dispose of the wastes in the on-site CERCLA waste management facility.



TDEC photo

Workers assist loading of contaminated soil during excavation of the Intermediate Holding Pond in Melton Valley.

3.0 Environmental Management

SWSA 4 Small Facilities D&D. DOE has this past year completed the demolition of three small facilities that were located within the footprint of the SWSA 4 waste burial ground. The facilities were a priority because they stood in the way of future CERCLA



TDEC photo

Workers seal piping during the demolition of a small facility near Solid Waste Storage Area 4 in Melton Valley.

remedial actions at the burial ground. For the most part the facilities were clean; however some hazardous waste was generated during demolition and is now being stored, awaiting disposal. The state has withheld final approval of project completion until DOE disposes of the waste material.

Old Hydrofracture Facility D&D.

Demolition of the Old Hydrofracture Facility main building and all other surface structures was completed. Most of the waste from this activity has been disposed in the on-site CERCLA waste management facility. However, the action has generated approximately 15,000 cubic feet of contaminated waste that will not meet the waste acceptance criteria of the CERCLA waste facility. DOE is searching for alternative disposal options for this

material. The state is withholding final approval of the action until all waste is properly disposed.

New Hydrofracture Facility D&D. Project planning and contracting is under way for demolition of the surface structures at the New Hydrofracture Facility. The remedial action involves D&D of the New Hydrofracture Facility building as well as grout material handling bins, process equipment, support systems, equipment footers, concrete walls and foundations, and metering pit/slotting pit walls. The action also involves the stabilization of tank T-13 and the remaining pit. Contaminated waste from this project is planned for disposal at the on-site CERCLA waste management facility. This project is scheduled for completion in FY 2004.

Plugging of Abandoned Monitoring Wells. The plugging and abandonment of 111 wells at the four hydrofracture sites in Melton Valley is now being performed as a CERCLA remedial activity. This project is part of the Melton Valley Interim ROD. This activity is necessary to help ensure that contaminants, previously injected into deep strata, will not migrate to the surface through unplugged well holes. The plugging of 42 wells during FY 2001 and FY 2002 is a significant accomplishment and is a good start toward an anticipated completion in late FY 2003.

High Flux Isotope Reactor. The High Flux Isotope Reactor (HFIR) is an active facility used for research into the effects of neutron interaction with various materials

3.0 Environmental Management

and for the production of medical and industrial isotopes. The division formed a HFIR Review Team in the spring of 2001 to increase state oversight of the HFIR facility. For 2002, the team concentrated on the following areas:

- The Special Building Hot Exhaust System;
- HFIR upgrades, including the new cooling tower and the temporary pool drain tanks;
- The Process Waste Drain Line, partially replaced due to a leak;
- The Plutonium-238 Project, undertaken by HFIR and the Radiochemical Engineering and Development Center; and
- Strontium-90-contaminated soil discovered upon excavation for new building addition.

In addition to reviewing problems that are identified as time goes by, the division's HFIR Review Team will review another HFIR system in detail every two years. It is hoped that the state can influence upgrades to the most antiquated and complicated HFIR support systems. Readers are invited to call TDEC at (865) 481-0995 for more information on HFIR oversight.

3.3 Y-12 NATIONAL SECURITY COMPLEX

3.3.1 Upper East Fork Poplar Creek Watershed

Located between Pine Ridge and Chestnut Ridge, the Upper East Fork Poplar Creek Watershed includes the main Y-12 plant and its surrounding area. This watershed lies to the east of the Bear Creek Valley Watershed and has more than 70 known sources of contamination.

A groundwater plume contaminated with nitrates, uranium-238, and other radionuclides and metals underlies the central plant area. This plume originates from the S-3 Ponds (on the divide with Bear Creek Valley Watershed) and from other sources within the plant.

The Upper East Fork Poplar Creek Phase I Interim ROD. The FFA parties signed this milestone document in May 2002. The Phase I ROD focuses on preventing contamination from moving away from source areas or cleaning up concentrations of contamination. This strategy includes the installation of asphalt caps over mercury runoff areas, flushing of contaminated sediment from storm sewers, relining or replacement of storm sewers as needed in the west end mercury area, construction of mercury treatment facilities, removal of contaminated sediments in Upper East Fork Poplar Creek and Lake Reality, monitoring, and land-use controls. Later RODs will address additional contaminated soils and sediments, decontamination and decommissioning (D&D) of buildings, and groundwater.

3.0 Environmental Management

Upper East Fork Poplar Creek East End Volatile Organic Compound Plume. In FY 2000 a pump-and-treat system was put in place to prevent further spread of groundwater contaminated with volatile organic compounds in Union Valley, just east of the Y-12 facility. The selected remedial action was to install a groundwater intercept well into the contaminated plume. Since installation, contaminated groundwater has been withdrawn, treated to meet discharge standards, and released back into the headwaters of East Fork Poplar Creek. This system both restricts the spread of the existing plume and removes contaminants from the groundwater.

3.3.2 Bear Creek Valley Watershed

Bear Creek Valley begins at a low divide west of Y-12. The watershed historically was used for disposal of wastes generated by nuclear weapons manufacturing activities at the plant. The primary waste streams were machining remnants of metallic uranium, solvents, nitrates, shock-sensitive and explosive chemicals, and contaminated tools and equipment. These wastes were buried in pits, poured into holding ponds, and burned. Bear Creek Valley now hosts a state-of-the-art disposal facility for CERCLA waste cleaned up on the ORR—the Environmental Management Waste Management Facility (EMWMF).



TDEC photo

A contractor takes part in the Bear Creek Valley Stream Mitigation Project resulting from construction of the EMWMF.

Boneyard/Burnyard Remedial Actions.

Excavation of contaminated soils and waste from the Boneyard/Burnyard CERCLA remedial action site began in spring 2002. At the time of this writing, approximately 30,000 cubic yards of uranium-contaminated soil and debris had been excavated, packaged, and disposed at the on-site CERCLA waste management facility. Barring unforeseen difficulties,

remediation of the Boneyard/Burnyard will continue through FY 2002, with completion expected in mid-FY 2003.

Bear Creek Valley S-3 Plume Treatment. The collection and treatment of uranium- and nitrate-contaminated water from the S-3 contaminated plume is an ongoing activity. The S-3 plume is a shallow groundwater plume that originates from four abandoned wastewater collection impoundments on the west end of the Y-12 site. The impoundments have been closed under a cap put in place under RCRA. However, contaminants released from the impoundments before they were closed continue to impact groundwater as it moves down Bear Creek Valley. The groundwater collection and treatment system treated more than 2 million gallons of water in 2001.

3.0 Environmental Management

Bear Creek Valley Special Projects. Over the years, more than 40 millions of pounds of uranium have been disposed in Bear Creek Valley near Y-12. The division began two new projects in 2001 to better define the effects of this disposal. One was designed to assess the fate and transport of uranium in the Bear Creek hydrological system. The second was a pilot study to determine the feasibility of monitoring radon emissions at the burial grounds.

1. **Uranium Transport in the Bear Creek Hydrological Regime:** In this investigation, division staff collected water and sediment samples from Bear Creek, its tributaries, and associated springs and seeps. The results from this sampling were used to estimate the amount of uranium traveling through the system, track the movement of this contamination, and identify the locations that contribute most significantly to the uranium burden of Bear Creek. While a number of sites contribute to this contamination, the largest source appears to be the Boneyard/Burnyard disposal area, where uranium was historically burned in open, unlined pits.
2. **Radon Monitoring at the Bear Creek Burial Grounds:** Radon is a colorless, odorless, radioactive gas that can be dangerous if inhaled at high concentrations. Since radon is produced by radionuclides in the uranium decay series, it has been speculated that the disposal of millions of pounds of uranium on the ORR may have resulted in elevated radon levels. In 2001, the division began a pilot study to determine the feasibility of monitoring radon on the ORR. Preliminary data indicate the radon levels can be measured and suggest the burial grounds have areas where radon levels are elevated.

While deploying radon detectors, division staff encountered radioactive waste on the surface of Burial Ground-D, on the east portion of the Bear Creek Burial Grounds. As a consequence, DOE has classified the site as a radiation control area, and measures to control the spread of contaminants are being expedited by mutual agreement of the division, DOE and EPA.

3.4 EAST TENNESSEE TECHNOLOGY PARK WATERSHED

The ETTP Watershed occupies 4,600 acres of land, only about 1,000 acres of which has been affected by operations at the former K-25 site. The watershed is partially bordered on the west by the Clinch River, and its tributary Poplar Creek runs through the area.

Principal contaminants in the groundwater are volatile organic compounds, some radionuclides, and various types of metals. The most pervasive contaminants are trichloroethylene and technetium-99. Surface water contamination is not a major problem.

Various types of contamination can be found in the shallow soils and the deeper soils. Shallow soils contain radionuclides, metals, and organics that can be traced back to spills, overflows, building runoff, and atmospheric releases. Petroleum products, volatile

3.0 Environmental Management

organic compounds, and some radionuclides are found in the deeper soils. This contamination is the result of waste line leaks, tank leaks, and burial grounds.



TDEC photo

D&D waste from East Tennessee Technology Park is shipped in containers such as these for permanent disposal at Envirocare of Utah.

ETTP's gaseous diffusion buildings and supporting facilities are also contaminated, and most will undergo decontamination and decommissioning (D&D). This work is necessary before remediation of soils can take place. The division actively oversees D&D projects at ETTP to ensure compliance with environmental regulations.

ETTP Zone 1. The ETTP Zone 1 area consists of the K-901 building, Duct Island, the K-770 area, the Powerhouse area, the K-1007-P Ponds, and peripheral areas outside of the main plant site, such as ED-3, the Contractors Spoil area, and Blair Road Quarry. Because few buildings and facilities currently exist in this section of ETTP, Zone I is considered to be the area easiest to remediate. Work at Zone 1 will define the process for remediation of the main plant area of ETTP. During fiscal

2001, the FFA parties developed a proposed plan for remediation that would allow for unrestricted industrial land use for the area. The ROD for Zone 1 has been delayed to incorporate agreements under the accelerated cleanup plan and should be signed in early FY 2003.

K-29, K-31, and K-33 Decontamination and Decommissioning. DOE signed a contract with British Nuclear Fuels LLC in August 1997 for the D&D of three large process buildings: K-29, K-31 and K-33. Work began in July 1998 at K-33, with DOE removing radioactive contaminants, storing waste, and recycling metals. The division has been overseeing this project continuously ever since. The Three Buildings D&D project is scheduled to be completed in FY 2004.

- Almost all the converter dismantlement and removal work had been completed in Building K-33 as of end of June 2002.
- The dismantlement work has started in Building K-31.
- More than 26 million pounds of metals has been removed and either disposed of as clean or stored on DOE property awaiting resolution of DOE's nationwide moratorium on release of metals into the public domain.

3.0 Environmental Management

- More than 102 million pounds of low-level waste has been removed and sent for disposal to Envirocare of Utah; more than 14 million pounds of waste has been shipped for disposal to the Nevada Test Site.

K-1070-A Burial Ground. After a wait of two years for the opening of the on-site CERCLA waste management facility to provide a primary disposal pathway, the excavation of the K-1070A waste burial ground at ETPP is now under way. Excavation of this 3-acre burial ground is being accomplished as a CERCLA activity and is necessary to prevent the spread of contaminants into the groundwater system as well as to mitigate against future human contact with the buried waste. If all goes well, this project will be completed late in FY 2003.

K-25/K-27 D&D. The decontamination and equipment removal in Buildings K-25 and K-27 are being done under CERCLA's non-time-critical removal process; however according to the accelerated cleanup plan, this project has been given a high priority. Buildings K-25 and K-27 were placed into operation in 1945 to enrich uranium through the gaseous diffusion process. The buildings were permanently shut down in 1964. Historic preservation of the K-25 building, one of the Manhattan Project Signature Facilities, is a concern to stakeholders. The K25/27 buildings D&D has only begun this past year. According to present schedules, this project will be completed by FY 2008.

Group II Buildings D&D Activities. The demolition of numerous contaminated and uncontaminated structures on the ETPP site is well under way. For contaminated structures, the activity is being accomplished under a CERCLA rule that allows removal actions to proceed with less formal review. This past year a total of eight buildings were removed. Demolition waste from these activities is being packaged and disposed at Envirocare in Utah, the Y-12 demolition landfill, and the on-site CERCLA waste facility. Disposal pathways are chosen largely based on cost and the waste acceptance criteria of the various facilities.

Uranium Hexafluoride. DOE stores approximately 7,000 cylinders of depleted UF₆ or its remnants at ETPP in several storage yards. The division's Radiological Monitoring and Oversight Program follows UF₆ management. Cylinder yards are evaluated in terms of risk to the public and the environment through field measurements and inspections.

The UF₆ Cylinder Yard Environmental Dosimeter Program provides a quarterly dose rate report for the UF₆ cylinders at ETPP to protect the public and workers associated with these areas. Currently, 102 environmental dosimeters are placed around the cylinder yards. These dosimeters measure the dose of gamma radiation to a hypothetical person located at the monitoring station 24 hours a day for a year. In the worst case, the dose is as high as

DOE stores approximately 7,000 cylinders of depleted UF₆ or its remnants at ETPP in several storage yards.

3.0 Environmental Management

8655 mrem, approximately 24 times natural background. This dose for an individual, although unrealistic, points to the high-dose areas that should be avoided or where caution should be maintained.

Division staff review quarterly reports and information from the cylinder information database and make site visits to observe cylinder yard activities and painting operations. As a result of DOE's ongoing maintenance operation, which is overseen by division personnel, the upgrade of the K-1066-J cylinder yard was completed and more than 400 cylinders have been relocated to the yard where they now are in compliance with storage requirements. A cylinder-painting program was initiated and more than 250 cylinders have been repainted for corrosion protection. Additionally, non-destructive assay testing has been completed on the first 500 12-inch cylinders that are to be shipped for disposal in 2002. Loading has been completed on 20 boxes containing 18 cylinders each. DOE completed the goal of 4,583 annual inspections.

D&D of ETP Building K-1420. The D&D of Building K-1420 began in FY 1999 at a projected cost of \$10 million. As of May 2000, the projected cost was \$12 million and the projected completion date was early 2001. However, in December 2000 a contract dispute over the cost of the job resulted in a suspension of all work on this project. At the time of suspension, the project was approximately 90 percent complete.

The status of this project has not changed by the end of the fiscal year. Negotiations are ongoing between DOE and the bonding company. DOE is requesting the bonding company to assume the necessary steps to complete contract performance under the bond.



TDEC photo

Workers access monitoring equipment on the stack of the TSCA Incinerator.

TSCA Incinerator. This incinerator, located at ETP, is the only incinerator in the United States permitted to treat mixed waste contaminated with PCBs ("mixed" waste contains both radioactive and hazardous contamination).

With the shutdown of DOE incinerators in Idaho and South Carolina, Oak Ridge Operations' TSCA Incinerator has become a "one of a kind" treatment option. Because of the potential need for access to this facility by sites elsewhere in the DOE complex, accelerated cleanup plans call for the incinerator to remain operational until 2006, instead of closing in FY 2003, as originally planned.

The division's Waste Management Program monitors the incinerator by

3.0 Environmental Management

conducting audits, observing tests, reviewing plans, verifying what is fed to the incinerator, and reviewing off-site waste streams destined for the incinerator. The incinerator once again operated during the year in compliance with its permit.

3.5 WASTE MANAGEMENT

3.5.1 Oak Ridge Environmental Management Waste Management Facility

Cleanup on the ORR under CERCLA regulations produces large volumes of contaminated waste, the management of which is a formidable disposal problem. Historically, there have been two options: package and ship the waste to out-of-state locations, or delay cleanup, leaving the waste where it is.

The option of leaving contamination in place is not acceptable for most sites, especially those with future uses or those that may be sources of groundwater contamination. Shipping the vast quantities of contaminated soil and debris to disposal sites in the western United States is prohibitively expensive. The ORR has long needed an on-site disposal facility that is properly engineered and constructed.

DOE, EPA, members of the public, and the state—through the division's Environmental Restoration Program—took part in the planning and decision-making that has paved the way for such a facility. During this fiscal year, construction of the first phase of the facility has proceeded to the point that it has begun accepting waste from several sites, including the Boneyard/Burnyard, Old Hydrofracture Facility, and K-1070-A Burial Ground.



The Environmental Management Waste Management Facility in Bear Creek Valley is clearly visible from Chestnut Ridge.

TDEC photo

Because of the nature of contaminants to be disposed, the facility will need to be maintained essentially forever. The state has received assurance from DOE that it can meet the long-term funding needs without annual appropriations. The state has established a trust fund to which DOE has been making annual allotments that will continue until the fund reaches \$14 million. The state will use revenue generated from the fund to perform surveillance and maintenance after final closure of the facility.

3.5.2 Solid Waste

The division, through its Waste Management Program, works to ensure that DOE adheres to provisions of RCRA (See Environmental Laws sidebar) and to the state's solid waste disposal regulations.

3.0 Environmental Management

The division performs a monthly audit of DOE Y-12 landfills. Additionally, the division continues to monitor DOE landfills by collecting and analyzing water samples obtained from monitoring wells and springs located in the vicinity of the sites. It also reviews DOE practices to ensure that radioactive waste is not disposed in landfills at Y-12.

In December 2001, TDEC's Solid Waste Management Division issued a Notice of Violation to DOE for the mismanagement of RCRA waste. This notice resulted from the discovery of RCRA items in legacy low-level waste boxes that were sorted by DOE prior to disposal at the Nevada Test Site.

3.5.3 Radioactive Waste Management

Low-Level Radioactive Waste. The DOE Low-level Waste Facility Federal Review Group Technical Review Team has completed review of the document analyzing the expected long-term performance of the remediation strategy proposed for the Solid Waste Storage Area 6 (SWSA 6), an LLW disposal area in Melton Valley. The review



TDEC photo

Low-level radioactive waste requiring remote handling is overpacked in concrete canisters at ORNL pending transportation to the Nevada Test Site for permanent disposal.

team recommended to the federal review group that the performance assessment be conditionally accepted. Although DOE originally wanted to use the remaining capacity in SWSA 6 for LLW disposal activities, after evaluating the feasibility and cost effectiveness, they decided instead to end disposal and plan for closure.

As of June 2002, the inventory of legacy LLW on the ORR was about 33,200 cubic meters. This does not include about 3,700 cubic meters of newly generated LLW and volumes of radioactive scrap metal at ORR scrap yards estimated previously at 13,546 cubic meters.

The state is committed to working with DOE to finalize the Comprehensive Waste Disposition Plan for the ORR. This plan is required under the accelerated cleanup plan agreement, which calls for DOE to dispose all of the legacy LLW inventories by the end of FY 2005.

Spent Nuclear Fuel. The division, represented by the Radiological Monitoring and Oversight Program, follows all spent nuclear fuel (SNF) issues, including inventory, storage, retrieval from below-grade storage, repackaging for shipping, shipping-cask

3.0 Environmental Management

inspection, and all other transportation issues related to SNF shipping. DOE is in the process of shipping all SNF to locations outside of Tennessee. Progress in this effort is summarized below.

- Except for High Flux Isotope Reactor SNF, all aluminum-clad SNF has already been shipped to the Savannah River Site in South Carolina.
- With the exception of a shipment of spent fuel from a foreign reactor (“KEMA” fuel), repackaging of all non-aluminum-clad SNF was completed during FY 2001, and it was made ready for shipment to Idaho National Engineering and Environmental Laboratory. The KEMA fuel has now been repackaged and, shipments of SNF to Idaho National Engineering and Environmental Laboratory are scheduled in FY 2003.
- The disposal location for Molten Salt Reactor Experiment fuel salts will be determined in future years.

3.5.4 Mixed Waste Site Treatment Plan

The Site Treatment Plan as discussed here and implemented through a TDEC Commissioner’s Order, applies specifically to mixed wastes on the ORR and provides overall schedules for achieving compliance with land disposal regulations for mixed wastes in Oak Ridge.

Through this process, DOE had reduced its inventory of historical mixed waste on the ORR by 56 percent as of March 31, 2002. However, the state is concerned that DOE may not be able to comply with established milestones as a result of DOE’s projected funding shortfall.

Significant progress has been made on the Transuranic Radioactive Waste Treatment and Packaging Facility under construction in Melton Valley. However, the receiving facility, the Waste Isolation Pilot Plant in New Mexico, has not yet received a permit from state regulators to allow it to receive transuranic waste that is so radioactive that it must be handled remotely by machines. Oak Ridge has the largest inventory of remote-handled transuranic waste in the DOE complex. This delay jeopardizes currently scheduled shipments of ORR transuranic waste and may interfere with the treatment schedule.

3.5.5 Facility Surveys

Five decades of nuclear weapons research and development has left a legacy of contamination in the local and regional environment, including land and water ecosystems. Most of the radiological and chemical contaminants were released directly from buildings and other facilities on the ORR.

In an effort to document the nature and sources of contamination, the division’s Radiological Monitoring and Oversight section conducts a Facility Survey Program. The program documents each facility’s operational history, physical condition, past release

3.0 Environmental Management

history, radioactive and chemical inventories, and potential for ongoing and future releases. The program also tracks demolition and construction activities on all three sites.

As facilities are examined, they are ranked according to their potential to impact the environment. Since 1994, the program has examined 161 facilities, 45 of which held a high potential for environmental impact. The program characterized 17 facilities in FY 2002 and found that eight of these posed a relatively high potential for releasing contaminants to the environment.

In many cases, the potential for environmental release is dominated by degraded facility infrastructure such as underground waste lines, substandard sumps and tanks, and leaky roofs and ventilation ductwork. This is particularly true at Oak Ridge National Laboratory, where many facilities are connected to an antiquated liquid LLW line system.

Facility concerns noted by TDEC are relayed to DOE, where corrective actions can be formulated. As DOE carries out corrective actions, facilities are removed from the division's list of high potential environmental release facilities.

3.5.6 Verification of Surplus Materials Release

Division staff review radiological control procedures and ensure that DOE and its contractors follow agreed policies for release of materials to the public. Under this program, staff from the Radiological Monitoring and Oversight section review occurrence reports when radioactively contaminated materials are inadvertently released. In addition, staff members check public auctions for adherence to release policies and may conduct spot radiological surveys. Surveys of public auction items were conducted for auctions by Y-12 Surplus Sales and ORNL Surplus Sales in July 2002.

Scrap metal is also monitored under this program. An inspection tour is planned of the various scrap metal collection points at ORNL. Scrap metal from the collection points is combined into larger loads for transfer to the buyer under an annual sales contract.

4.0 Regional Environment

While pollutants released from the ORR have substantially decreased over the years, regulators and residents remain concerned that air emissions from current activities (e.g., incineration of radioactive wastes, production of radioisotopes, and remedial activities) could pose a threat to public health and the environment if not properly controlled. The Tennessee Oversight Agreement requires the state to do the following:

- Perform independent oversight and evaluation of DOE's environmental monitoring programs;
- Monitor radiation on the ORR and environs, as necessary, to detect and characterize off-site contamination and human exposure; and
- Evaluate performance of on-site control measures to prevent releases to the environment.

4.1 WATER QUALITY

There are more than 100 miles of surface streams and considerable (but unknown) quantities of groundwater in East Tennessee that have been contaminated as a consequence of activities on the ORR. While effluents from process waste treatment facilities contribute to this contamination, a large proportion of the pollutants found on the ORR can be attributed to releases from antiquated and deteriorating waste disposal, transport, and storage facilities. These contaminants migrate to groundwater, where they are discharged to local streams and transported to the Clinch River.

Each of the division's programs has been delegated specific responsibilities that contribute to protection of the state's water resources. These responsibilities include the oversight of DOE monitoring systems and independent monitoring as necessary to verify DOE data and ensure the health of the public and environment.

4.1.1 Drinking Water Supplies

The division continued to oversee maintenance and compliance activities for the water treatment and distribution systems serving DOE's Oak Ridge facilities. This work includes the following:

- Independent monitoring of residual chlorine levels;
- Oversight of cross-connection controls, water line repairs, and the general status of distribution systems; and
- Monitoring of the transition of water system operations from DOE to municipal or private contractor control.

4.0 Oak Ridge Regional Environment

The division did not detect any serious threats to worker or public safety. However, given the challenges present on the ORR—including burial grounds, contaminated soils, and contaminated groundwater—evaluation of the potable water distribution systems at the three plant sites remains an ongoing need. Noteworthy events and activities on site are listed below.

ORNL. A new 1.5 million-gallon reservoir went online in October 2001. Prior to an April 2002 state sanitary inspection, the old 2.5 million-gallon reservoir was drained to facilitate repair of a longstanding leak. Preliminary construction activities began for the buildings in East Campus that are being developed under a public-private partnership agreement. These activities will include tie-ins to the surrounding water distribution system and possible relocation of existing water mains with the construction zone. DOE's Oak Ridge Operations Office submitted engineering plans and drawings for state approval of a project to upgrade the fire protection system for the 6000 area at ORNL.

Y-12. A number of aging structures are slated for removal as part of Y-12's footprint reduction program. Water service lines leading to these sites have been or will be cut and capped. In turn, anticipated facility upgrades at Y-12 may extend to the water distribution system.

ETTP Water Quality Project. Concerns about the current and past safety of drinking water at ETTP led to a two-phase study of water distribution systems at the site. The Phase 1 Water Study, available to the public at the DOE Information Center (see Section 7.4.4) conducted during August 2000, focused on present-day systems. Since 1998, Operations Management International, a private firm, has operated the ETTP water treatment plant and drinking water system under a contract with the Community Reuse Organization of East Tennessee. Analytical results for samples collected from sanitary and firewater systems at the site indicated that detectable levels of contaminants fall below EPA and state regulatory levels. The Phase 2 report, also available, examined historical operations at the facility.

City of Oak Ridge. The city's water treatment plant, formerly owned by DOE and located on Pine Ridge within the reservation boundaries, supplies water to ORNL and Y-12 as well as the city. Two 24-inch mains supply raw water from the Clinch River to the water treatment plant. In February 2001, the west raw water main ruptured beneath Bear Creek Road near the entrance to the Y-12 plant. Later that year, in August, the east main did the same. In each case, city workers quickly completed repairs.

Clark Center Park. Historically, Clark Center Recreation Park met its potable water needs with surface water from the Clinch River. DOE contractors operated the park's two canister-filter water treatment systems. During the summer of 2001, the city completed the installation of a polyvinyl chloride pipeline to deliver city water to the park.

Environmental Radiation Ambient Monitoring System (ERAMS) Drinking Water Program. Since the Clinch River serves as a raw water source for public water supplies in the area, there is a potential for these supplies to be impacted by ORR releases. To address this possibility, the division arranged for area treatment facilities to be

4.0 Oak Ridge Regional Environment

included in EPA's ERAMS drinking water program. This program monitors drinking water from public supplies near nuclear facilities throughout the nation. In the Oak Ridge program, EPA provides radiochemical analysis of drinking water samples collected by the division at five area water supplies. These utilities include the following:

- Kingston Water Treatment Plant,
- Gallaher (K-25) Water Treatment Plant,
- West Knox Utility,
- City of Oak Ridge (Y-12) Water Treatment Facility, and
- Anderson County Utility District.

When radionuclides carried by ORR streams enter the Clinch, their concentrations are lowered by the dilution provided by the river. With exceptions, the contaminant levels are further reduced in drinking water by conventional water treatment practices used by the local utilities. Consequently, the levels of radionuclides and other contaminants measured in the Clinch and at area water supplies are far below the concentrations reported for many of the ORR streams. To date, results from the ERAMS analysis have all been below applicable drinking water standards.

As in previous years, the results reported for tritium were higher for the Gallaher plant than for the other facilities monitored in the program (Figure 1). This facility is the first treatment system downstream of White Oak Creek, which is the major contributor of radionuclides flowing from the ORR. While tritium results were higher at the Gallaher plant, they were all well below the standard prescribed by the Safe Drinking Water Act.

White Oak Creek is the major contributor of radionuclides flowing from the ORR.

4.1.2 Groundwater

Groundwater is contaminated beneath the three DOE facilities and the South Campus Facility, with notable plumes from past operations and continued releases from past waste disposal sites.

At ORNL, radionuclides contaminate groundwater in the main campus area, with strontium-90 being the major concern. Groundwater beneath the maintenance facility contains solvents. Waste from operations disposed in adjacent Melton Valley include tritium and many radionuclides, as well as chemicals from experiments.

Groundwater in the vicinity of Y-12 contains metals (including mercury), solvents (including carbon tetrachloride), and uranium. Y-12 also has the S-3 ponds, which have been closed with contaminants in place and which produce a nitrate plume with significant amounts of uranium. Y-12's waste area in adjacent Bear Creek Valley contains uranium, PCBs, and solvents, some of which are present in secondary sources where these denser liquids sank deep in the cavernous bedrock below the water table.

Groundwater at ETTP has considerable quantities of solvents and measurable amounts of uranium and other radionuclides, such as technetium-99.

4.0 Oak Ridge Regional Environment

Many historical environmental releases on the ORR are decaying into daughter products that are often more toxic than the initial materials. The ORR has a large buffer area around it, and the Clinch River ultimately dilutes many of the groundwater discharges. DOE-contaminated groundwater rises in springs near watercourses on DOE property, Tennessee Valley Authority property, and other areas to flow and mix with waters of the state. In most of these cases, restrictions on groundwater use are communicated to non-DOE land users. Also, there are plumes of contaminated groundwater moving rapidly in cavernous conduits of the karst bedrock aquifer under areas such as Chestnut Ridge and Union Valley.

Aquifers in soluble carbonate rocks are common on the ORR. These areas have springs, sinkholes, and other features that collectively are termed “karst.” Karst aquifers transmit contaminants in an unpredictable manner, making it difficult to investigate and clean up such areas. The South Campus Facility on Bethel Valley Road is located on a karst aquifer, and the extent of solvent-contaminated groundwater is uncertain, although it rises in springs near the site. Institutional controls, as described in the “Record of Decision for Oak Ridge Associated Universities South Campus Facility, Oak Ridge, Tennessee (DOE/OR/02/1383&D3),” available at the DOE Information Center, restrict the use of this groundwater.

In addition to past releases, current operations sometimes also pollute the groundwater. A leaking pipe at the HFIR releases tritium to groundwater. The tritium has flowed away from monitoring locations at HFIR into adjacent areas of contamination. Petroleum storage tanks have also released material to existing areas of groundwater contamination, creating challenges to separate current operations from past releases. The initial groundwater data for the EMWMF shows the presence of fission products and metals from no apparent sources.

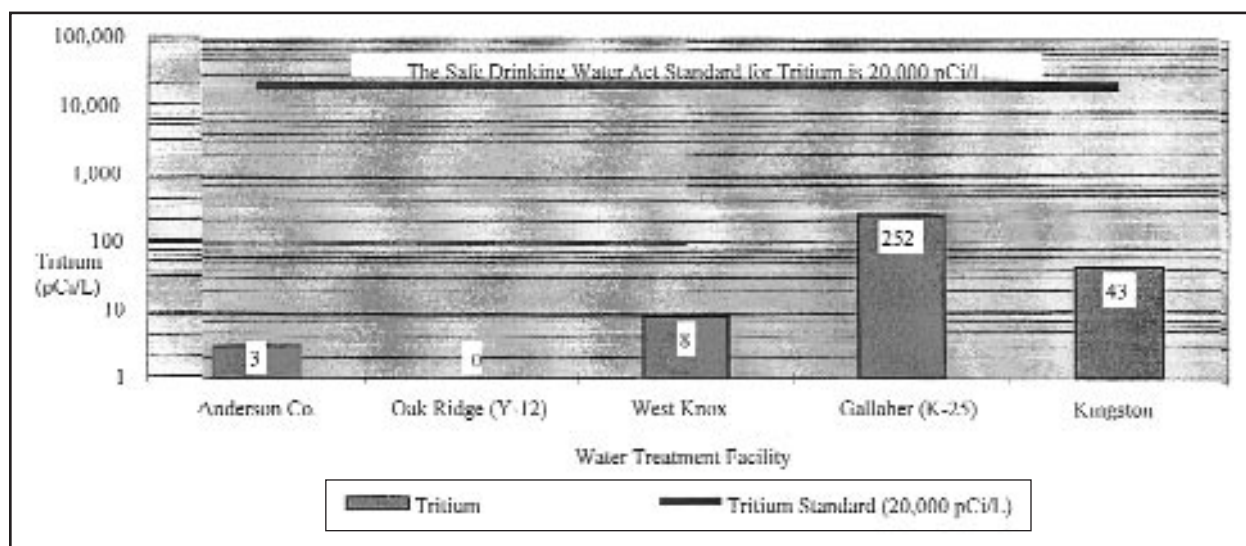


Figure 1. Average tritium results for 2001 for samples of finished drinking water taken at Oak Ridge area water treatment facilities in association with EPA's ERAMS program.

4.0 Oak Ridge Regional Environment

The division's groundwater programs range from a review of DOE efforts to independent sampling and groundwater-tracing investigations. The division oversees the plugging and abandonment of monitoring wells on the ORR, samples off-site residential drinking water wells, and helps collect and evaluate data for DOE's Oak Ridge Environmental Information System. The division also reviews documents released by DOE under CERCLA, NEPA, and other programs that may influence groundwater cleanup or groundwater use decisions on the ORR.

Residential Groundwater Sources. The division in FY 2002 has identified 72 residential wells or springs near the ORR to evaluate for potential contamination. In FY 2002, eight sources were sampled. The sources to be tested were chosen according to geology, depth to water production, and proximity to the ORR.

Residential groundwater samples were tested for volatile organic compounds, nutrients, radiochemicals, general inorganic compounds, and metals. These tests were selected in order to evaluate the general groundwater quality and to identify certain chemicals and radionuclides.

Results were compared to maximum contaminant levels established by the Safe Drinking Water Act. These test results indicate that the water in these sources is not currently affected by DOE operations. Most homeowners interviewed are satisfied with groundwater quality, and the quality of water from these sources appears to be good.

In addition to past releases, current operations sometimes also pollute the groundwater.

Springs and Seeps. The division sampled springs and seeps 46 times in FY 2002. Several springs sampled in Bear Creek Valley are contaminated by Y-12 activities and show elevated levels of nitrates, metallic uranium, gross alpha activity, and gross beta activity. Two off-site springs east of Y-12 are of special interest. The University of Tennessee Arboretum spring "Bootlegger" did not show volatile compounds as it has in the past, possibly due to the diluting effects of high rainfall this spring. The Union Valley spring had elevated levels of volatile organic compounds. Some springs at ETTP show elevated volatile organic compounds and radionuclides. ORNL springs during this sampling period did not show elevated levels, but some of these springs have in the past shown elevated levels of radionuclides.

Monitoring Wells. None were co-sampled during FY 2002

Plugging and Abandonment of Wells. This project consists of requesting and reviewing data on ORR wells that will be—or have been—plugged and abandoned. There are more than 4,000 monitoring wells and borings on the ORR. With the exception of RCRA and Underground Storage Tank regulations, the state has no specific regulations concerning the plugging and abandonment of monitoring wells unless it can be demonstrated that the wells are contributing to pollution. A total of 42 wells in 2001 and

4.0 Oak Ridge Regional Environment

eight wells in 2002 have been plugged at the ORNL hydrofracture site as part of the remediation of the hydrofracture project. Division staff have observed field activities and helped review plans for these projects.

Underground Storage Tanks. The division conducts oversight of the underground storage tank program on the ORR. In FY 2002, the division tracked sites that have been integrated into the CERCLA cleanup program.

4.1.3 Surface Water

Surface Water Sampling. The division's Environmental Monitoring and Compliance Program sampled surface water at 25 sites in FY 2002. Twenty-two of these sites have been chosen to detect contamination from DOE. The other three are located upstream from the ORR and serve to provide background data.

The sites were sampled twice in FY 2002; these results will be published in the April 2003 Annual Monitoring Report, available to the public from the division. Samples were analyzed, and the results were compared with Tennessee Water Quality Criteria, a state water quality standard published by TDEC and based on the Clean Water Act. The division has not observed substantial concentrations of pollutants coming from the reservation. Although the state has found that White Oak Creek is not supporting its designated uses under the Water Quality Criteria, the creek does not alter the designated use of the Clinch River. This is because the Clinch is a much larger stream and, therefore, dilutes contaminants from White Oak Creek.

Groundwater Basin Delineation. In FY 2002, the division conducted a series of groundwater traces using fluorescent dyes to delineate selected groundwater basins, allowing groundwater velocities and direction of flow and flow paths to be established. The results also can be used to determine if contaminants can be carried in groundwater at depth from disposal facilities to springs or seeps.

Bear Creek Valley was chosen as the site for study. Water was traced from a swallet to several springs. A sinkhole that formed during construction at the SNS site on Chestnut Ridge was also traced to a spring in Bear Creek Valley.

Information obtained from groundwater traces will be very useful in future land use issues that involve construction of DOE facilities and the transfer of DOE property to the private sector. This information would allow the division to select more knowledgeable monitoring points and make an impact on the present and future use of DOE property.

4.1.4 Water Pollution Control

National Pollutant Discharge Elimination System Compliance. Division Waste Management staff monitored the various phases of the ORR wastewater treatment facilities' operations, their radiological effluents, their potential impacts to the water quality standards both on and off the ORR, and possible impacts to human health and environment. The staff reviewed and evaluated monthly Discharge Monitoring Reports for

4.0 Oak Ridge Regional Environment

reported noncompliance with the discharge permits for ETTP, ORNL, and Y-12. The official copies of these permits are held by the TDEC Division of Water Pollution Control.

The division's comprehensive water pollution audits conducted in June 2002 at ORNL showed no immediate threat to human health or significant harm to the environment.

The staff continued to monitor in-stream levels of mercury in East Fork Poplar Creek at station 17 at the Y-12 boundary, to assist the Environmental Restoration program in decisions leading to mercury abatement at Y-12.

Aquatic Resource Alteration Permits and Wetlands Protection. The division assisted DOE and the state Water Pollution Control division Knoxville Environmental Assistance Center in review of Aquatic Resource Alteration Permits for the ORNL and ETTP projects. The division's involvement and recommendations, including site visits and CERCLA documentation review, facilitated and streamlined permitting decisions. The official copies of the permits are held by Water Pollution Control.

The staff performed inspections of erosion and sediment control practices for new construction sites on the ORR, including the Spallation Neutron Source, Transuranic Waste Treatment Facility, and ORNL campus upgrade projects. No adverse impacts to wetland resources were noted, and observed erosion and DOE addressed sediment control problems in a timely and responsive manner.



TDEC photo

The Process Waste Treatment Complex is one of several ORNL facilities routinely inspected by division personnel to ensure compliance with its National Pollutant Discharge Elimination System permit.

Biosolids Application Program. This program is an agreement between DOE and the City of Oak Ridge to allow the city to spread sludge from the sewage treatment plant on ORR property. The staff attended meetings with DOE, the City of Oak Ridge, and DOE contractors, and performed the review of analytical data to increase allowable radionuclide and heavy metals soil loading rates. No potential impacts were noted either to water quality on and off the ORR or to human health and the environment.

4.0 Oak Ridge Regional Environment

Toxicity Biomonitoring. The division reviewed ORR Toxicity Reports and the DOE 2001 Annual Site Environmental Report. The results of toxicity testing indicate that the monitored outfalls at all three DOE sites complied with conditions of their discharge permits. In 2001, the division performed independent toxicity biomonitoring tests of DOE discharges at the ETTP Sewage Treatment Plant and ORNL Coal Yard Runoff Treatment Facility. These tests confirmed that effluents from these facilities did not exhibit toxicity in excess of the permit limits.

4.2 AIR QUALITY

The division has developed air-sampling programs that provide independent monitoring of air in the vicinity of the ORR and oversight of DOE air monitoring systems. These programs have been developed with the cooperation of DOE and EPA and were designed to verify and complement monitoring performed by DOE contractors. The program focuses on sampling pathways for pollutants leaving the reservation and diffuse (non-point) sources of emissions on the ORR. Results reported for the programs in 2001 indicated no significant impact on ambient air quality from DOE activities.

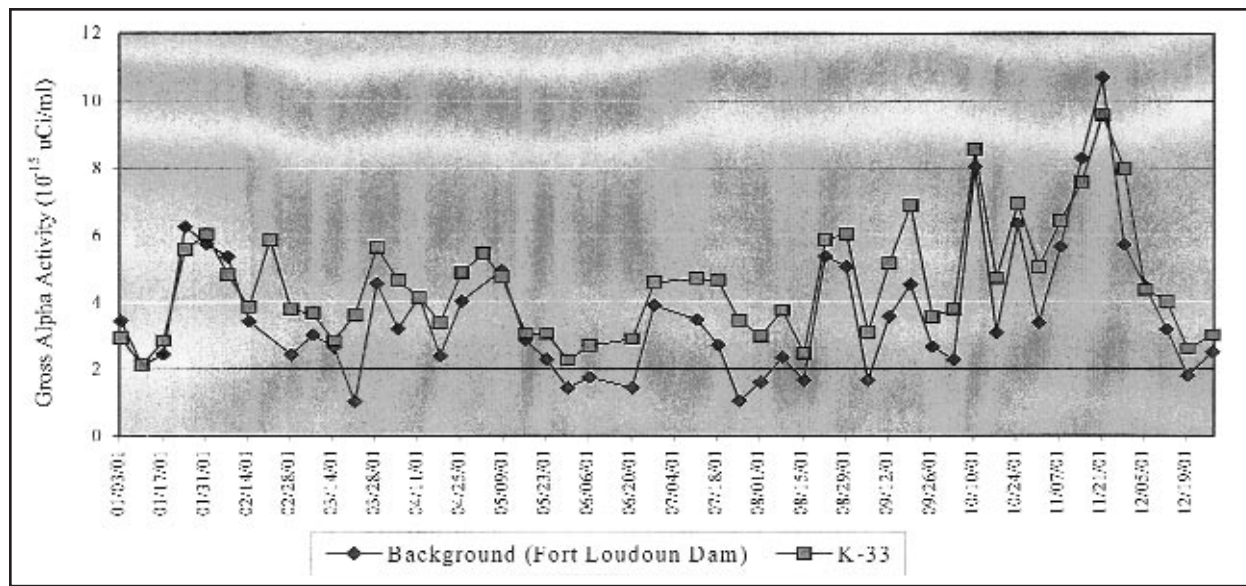
4.2.1 Ambient Air Monitoring for Radionuclides

While pollutants released from ORR facilities have substantially decreased over the years, concerns have remained that air emissions from current activities (e.g., incineration of radioactive wastes, radioisotopes production, and remedial activities) could pose a threat to the public health or the environment. In response to this concern, the division has developed programs that provide independent monitoring of air on the reservation and oversight of DOE monitoring systems. The division's Perimeter and Fugitive Air Monitoring programs focus on exit pathways and diffuse (non-point) sources of pollutants. Data from the division's participation in EPA's ERAMS supplements results from the other two programs and provides verification of state and DOE monitoring.

Results for each program are compared annually to environmental standards provided in the Clean Air Act and background measurements taken at Fort Loudon Dam in Loudon County. In 2001, the results for the Perimeter and ERAMS Air Monitoring Programs were consistent with data taken from the background station. The results from the Fugitive Air Monitoring Program were somewhat higher than those reported for the background station (Figure 2), but the values reported do not indicate a significant impact on the local environment and they do not exceed environmental standards provided in the Clean Air Act.

During the monitoring period, the fugitive air monitor was stationed near Building K-33, which is at ETTP undergoing cleanup activities in association with DOE's reindustrialization effort. Slightly elevated results at this monitor were possibly from K-33 cleanup activities, materials suspended during an aggressive building demolition program at ETTP in 2001, or unidentified localized phenomena.

4.0 Oak Ridge Regional Environment



TDEC

Figure 2. Gross alpha activities reported for calendar year 2001 monitoring performed at Building K-33 and the background station at Fort Loudoun Dam.

4.2.2 Ambient Gamma Monitoring (Oak Ridge Reservation Wide)

Gamma radiation is emitted by various radionuclides that have been produced, stored, and disposed on the ORR. Associated contaminants are evident in ORR facilities and the surrounding environment. To assess the risks posed by these contaminants, the division uses environmental dosimeters and continuous exposure rate monitors to measure the radiation dose and exposure levels at selected locations on and in the vicinity of the ORR.

Results from environmental dosimeters are compared annually to background values and the state primary dose limit for members of the public (100 mrem/year, approximately one-third of the average natural dose). The dose reported for each site is based on continuous exposure over the course of the year, resulting in conservative estimates of the potential dose to the public at the specific location. This data is used to estimate the dose to the public from DOE operations and the need for and effectiveness of remediation.

All the doses reported for 2001 at off-site locations were below the state primary dose limit for members of the public. However, the limit was exceeded in several locations on the reservation that are potentially accessible to the public. These sites are primarily associated with UF₆ cylinder storage yards at the East Tennessee Technology Park, where DOE's reindustrialization initiative has resulted in an influx of businesses unrelated to DOE operations.

As in the past, various sites located in restricted areas of the reservation exhibited annual doses in excess of the dose limit for members of the public. These sites are

4.0 Oak Ridge Regional Environment

subject to remediation under CERCLA and the FFA. The doses for several of these locations decreased in 2001 due to remedial activities. These sites include ORNL's 3513 Waste Holding Basin, the North Tank Farm, and the Old Hydrofracture Facility Surface Impoundment.

Environmental dosimeters provide a cumulative dose over relative long periods (e.g., mrem/quarter); they cannot depict short-term fluctuations in radiation level. The continuous exposure rate monitors used by the division record radiation levels over short periods (1 minute to 2 hours), providing an exposure rate profile that can be correlated with specific activities or changing conditions. In 2001, the gamma monitors were stationed at a background location (Fort Loudoun Dam) and four sites undergoing remediation. Three of these sites--the 3513 Waste Holding Basin, the Corehole 8 Remedial Action project, and the Molten Salt Reactor Experiment--are located at ORNL. The fourth site was located at ETTP inside Building K-33.

The highest results recorded in 2001 were at Corehole 8. At this site, unanticipated levels of transuranic wastes were encountered during the excavation of an underground storage tank and contaminated soils. Exposure rates at the site substantially decreased after the removal action was temporarily suspended and the excavation filled (Figure 3). Exposure rates measured at the 3513 Waste Holding Basin have decreased since 1999, as remediation of contaminated sediments in the basin has progressed. The exposure rates recorded at the Molten Salt Reactor Experiment in 2001 were consistent during the monitoring period, except for several instances in May when the measurements rose by more than 65 percent. These excursions have been attributed to the removal of uranium-laden charcoal from the reactor's filter bed. The exposure rates recorded at Building K-33 were similar to the background measurements taken at the Fort Loudoun Dam.

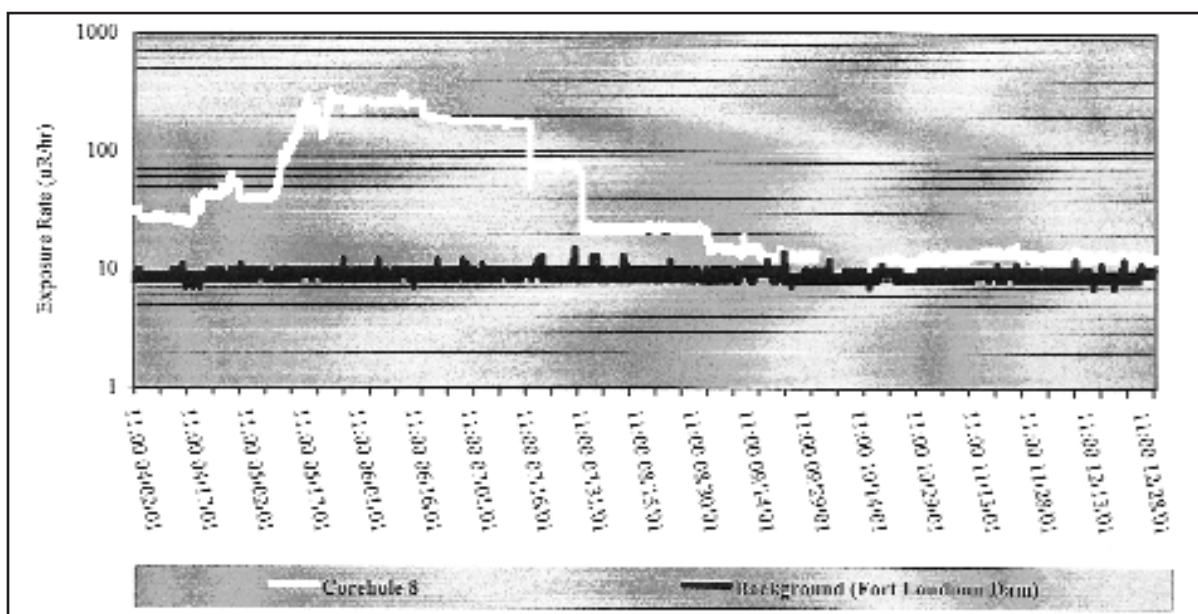


Figure 3. Results of continuous gamma exposure rate monitoring at the Corehole 8 remedial action and background measurements taken at Fort Loudoun Dam in Loudon County. TDEC

4.0 Oak Ridge Regional Environment

4.2.3. Air Pollution Control

Review of Permitted Air Emissions Sources. The division performed the annual air permit audits for ORNL, ETTP, and Y-12. The staff accompanied TDEC Division of Air Pollution Control personnel on an inspection of the Uranium Chip Oxidation Facility at Y-12. All ORR sites are meeting state air pollution control regulations, and no violations were noted.

The division continued to monitor the open burn campaigns carried out on the ORR. DOE is allowed in these campaigns to burn brush, debris from logging activities, and occasionally clean construction wood scrap.

Oversight of Asbestos Management and Removal. The division continued oversight of the asbestos management and removal on the ORR to ensure compliance with air pollution control regulations. Asbestos removals were ongoing with appropriate methods, removed asbestos was kept and disposed in a proper manner, and no releases were noted. The staff performed an annual audit of the ORNL asbestos management program. All facets of that program were found to be in compliance.

Hazardous Air Pollutants Metals Monitoring. In 1997, the division established an independent monitoring effort to identify overall levels of hazardous pollutants in the air on and around ETTP. The division established comparable air monitoring programs at ORNL and Y-12 in calendar year 1999. High-volume samplers are operated at these sites, and samples are collected and analyzed at the State Environmental Laboratory in Nashville for the following selected heavy metals: arsenic, beryllium, cadmium, chromium, lead, nickel, and uranium as a metal.

Laboratory analyses received to date indicate no elevated levels of any of these constituents in the ambient air over the ORR. Levels of most constituents are generally at or below detection levels and do not approach National Ambient Air Quality Standards.

4.3 SOIL AND SEDIMENT QUALITY

4.3.1 Sediment

The division's Environmental Monitoring and Compliance Program samples sediments at 30 sites, 10 of which are located on the Clinch River and two on the Tennessee River. The other 18 sites are located on tributaries of the Clinch River draining from the ORR; these are considered "exit pathways." None are on a stream, such as White Oak Creek or Poplar Creek, that has already been identified as contaminated and that is currently monitored by DOE.

Samples were analyzed for organic, inorganic, and radiological contaminants. The results were compared with standards, known as Preliminary Remediation Goals, established for the ORR based on guidance from EPA. These standards were used because there are no regulatory guidelines for sediment quality, either at the state or federal

4.0 Oak Ridge Regional Environment

level. The sediments met the standards for recreational use, meaning that people can safely engage in activities such as fishing, hiking, and playing at these locations.

Lower East Fork Poplar Creek Floodplain Sampling. Excessive rains during the week of March 13 to 20, 2002, caused East Fork Poplar Creek to flood. Members of the community expressed concern that this flooding may have caused sediments from the creek to be deposited on the floodplain. Following the rain, 11 locations were selected along the creek where obvious deposition of sediments had taken place. Samples of these sediments were taken and analyzed for total mercury. Other areas of obvious flooding were observed, but a lack of adequate sediment deposition prevented sampling.

Sample analysis found from 0.44 to 76.7 mg/kg of mercury. Although these concentrations are significantly above background levels in soil, they are far below the levels established by the CERCLA Record of Decision for Lower East Fork Poplar Creek for protection of human health (400 mg/kg). Based on these results, it is apparent that sediment from East Fork Poplar Creek is being redeposited on the floodplain as a result of heavy rains, but this deposition does not warrant further action at this time.

Radiological Field Surveys. Throughout the year, the Environmental Restoration Support Section performs radiological surveys over land parcels that may be used by non-DOE entities. Parcels of land are historically reviewed, walked over, observed and radiologically surveyed. Areas are mapped, and samples are taken if concerns arise. Areas of concern are documented for further evaluation. Parcels reviewed during FY2002 include the following:

I -75 Connector Routes. Existing or potential routes near DOE-contaminated areas were presented to the Tennessee Department of Transportation. Areas along the routes were traversed for environmental concerns.

South Campus Facility (Parcel G). A radiological walkover was performed. No environmental concerns on land were noted. Sediment samples for radionuclides, organics, and metals were taken from the three ponds on site with no significant contamination found.

ORNL East Parking Lot—Construction Area (surface only). A radiological survey was performed over the designated area of expansion for ORNL. No intrusive sampling was done. No areas of elevated radiation were encountered.

Tennessee Department of Transportation Bridge Expansion—Solway and Highway 58. A radiological survey revealed no areas of concern prior to construction. Spot checks were made at Highway 58 due to worker concerns of excavated material. No contamination was detected.

4.3.2 Environmental Monitoring

Due to reindustrialization at ETPP, a walkover survey was instituted along Poplar Creek from its confluence with the Clinch River upstream to the mouth of East Fork Poplar Creek. The main purpose of this study was to identify the ecological pathways

4.0 Oak Ridge Regional Environment

and impacted areas where Poplar Creek and its floodplain on the ORR may have become contaminated by deposition of radionuclides in channel sediments. A boat was used to survey the shorelines along steep and difficult-to-access areas.

No new discoveries of radioactively contaminated sites were found during the course of the survey. High radiological readings were detected in the vicinity of the cylinder yards and were deduced as shine, once soils were screened. “Shine” is the detectable radioactive emissions that can be distinguished at a distance from the actual source. The results of the ambient gamma radiation monitoring of Poplar Creek from its confluence with the Clinch River upstream to the mouth of East Fork Poplar Creek can be found in the division’s 2001 Environmental Monitoring Report, obtainable at the division office upon request or at <http://www.state.tn.us/environment/doeo/EMR2001.pdf>.

4.4 FOOD AND WILDLIFE QUALITY

4.4.1 Environmental Biomonitoring and Oversight

The ORNL Biological Monitoring and Abatement Program (BMAP), a joint program by DOE and its contractor UT-Battelle, looks for the effects of contamination by studying various organisms on land and in streams on the ORR. Studies include toxicity monitoring, bioaccumulation monitoring, biological indicators, and in-stream ecological monitoring of fish and benthic macroinvertebrate communities. These projects define the ecological standing of a system by assessing its biotic integrity, identifying possible sources of ecological damage, and determining the effectiveness of DOE remediation efforts. Results from BMAP annual sampling events allow for long-term assessments regarding the status of an ecosystem. Through BMAP oversight activities and independent monitoring programs conducted by the division, the state provides a means of confirming results obtained by BMAP personnel.

The Environmental Restoration Support Section of the Radiological Monitoring and Oversight Program conducted an independent biological monitoring program. The project involves the sampling of vegetation on the ORR using watercress as the bio-indicator. Habitats sampled include springs, seeps, and streams with spring water tributaries, especially known impacted or contaminated springs on the ORR, and also background locations.

Since the project inception date of November 2001, 12 watercress samples have been collected and submitted to the TDEC environmental laboratory for analysis of gamma radionuclides, gross alpha levels and gross beta levels. Laboratory analyses from these samples has determined uptake of mainly “gross beta” constituents.

4.4.2 Milk Sampling

The division’s Environmental Monitoring and Compliance Program oversees DOE cow’s milk sampling locations around the ORR. DOE contractors take samples of raw cow’s milk from four locations in the vicinity of the ORR and analyze them for

4.0 Oak Ridge Regional Environment

Current Fish Tissue Advisories (December 2002)

Stream	County	Portion	Pollutant	Comments
East Tennessee				
Boone Reservoir	Sullivan, Washington	Entirety	PCBs, chlordanes	Precautionary advisory for carp and catfish.*
Chattanooga Creek	Hamilton	Mouth to GA state line	PCBs, chlordanes	Fish should not be eaten. Also avoid contact with water
East Fork Poplar Creek including Poplar Creek embayment	Anderson, Roane	Mile 0–15.0	Mercury, PCBs	fish should not be eaten. Also avoid contact with water.
Fort Loudoun Reservoir	Loudon, Knox, Blount	Entirety	PCBs	Commercial fishing for catfish prohibited by TWRA. No catfish or largemouth bass over 2 pounds should be eaten. Do not eat largemouth bass from the Little River embayment.
Melton Hill Reservoir	Knox, Anderson	Entirety	PCBs	Catfish should not be eaten.
Nickajack Reservoir	Hamilton, Marion	Entirety	PCBs	Precautionary advisory for catfish.*
North Fork Holston River	Sullivan, Hawkins	Mile 0–6.2	Mercury	Do not eat the fish. Advisory goes to TN/VA line.
Tellico Reservoir	Loudon	Entirety	PCBs	Catfish should not be eaten.
Watts Bar Reservoir	Roane, Meigs, Rhea, Loudon	Tennessee River portion	PCBs	Catfish, striped bass and hybrid (striped bass–white bass) should not be eaten. Precautionary advisory for white bass, sauger, carp smallmouth buffalo and largemouth bass.*
Watts Bar Reservoir	Roane, Anderson	Clinch River arm	PCBs	Striped bass should not be eaten. Precautionary advisory for catfish and sauger.*
Middle Tennessee				
Woods Reservoir	Franklin	Entirety	PCBs	Catfish should not be eaten.
West Tennessee				
Loosahatchie River	Shelby	Mile 0–20.9	Chlordane, other organics	Do not eat the fish.
McKellar lake	Shelby	Entirety	Chlordane, other organics	Do not eat the fish
Mississippi River	Shelby	MS state line to just downstream of Meeham–Shelby State Park	Chlordane, other organics	Do not eat the fish. Commercial fishing prohibited by TWRA.
Nonconnah Creek	Shelby	Mile 0–1.8	Chlordane, other organics	Do not eat the fish. Advisory ends at Horn Lake road bridge.
Wolf River	Shelby	Mile 0–18.9	Chlordane, other organics	Do not eat the fish.

* Precautionary Advisory—Children, pregnant women, and nursing mothers should not consume the fish species named. All other persons should limit consumption of the named species to one meal per month.

4.0 Oak Ridge Regional Environment

radiological contamination. The data show that milk from the sampling area is not contaminated.

4.4.3 Vegetation Sampling

The division's Environmental Monitoring and Compliance Program conducted oversight visits to DOE vegetable sampling locations around the reservation in FY 2002. DOE contractors purchase lettuce, tomatoes, and turnips from area gardeners for radiological analysis. The sample locations are Lenoir City, various places in the City of Oak Ridge (including a special focus on the Scarboro community), Kingston, and the Claxton community. The data show no radiological contamination in the vegetables.

4.4.4 Fish

The division participates each year in the posting of signs advising against fish consumption and water contact in waters of the state that have been or could be impacted by DOE operations. The DOE-related advisory posting program is part of a larger, more encompassing sign posting and sign inspection project coordinated by the TDEC's Environmental Assistance Centers in Knoxville and Chattanooga.

The division focuses its efforts on waters surrounding the ORR. Areas of responsibility include Melton Hill Reservoir, with 24 catfish advisory postings, and Watts Bar Reservoir (including the Clinch River, Tennessee River, and Lower Tennessee River Arms), with 38 advisory or precautionary postings. The advisory postings include warnings against consumption of catfish, striped bass, and Cherokee bass (striped bass/white bass hybrid). Precautionary postings warn certain groups of individuals (children, pregnant women, and nursing mothers) not to eat any of the listed fish. All others are warned to limit their consumption to about 2 meals per month. Fish included on precautionary signs are white bass, sauger, carp, smallmouth buffalo, and largemouth bass.

Posting inspections are also conducted along East Fork Poplar Creek from Y-12's Bear Creek Road entrance to East Fork Poplar Creek Kilometer 6.3, where Oak Ridge Turnpike crosses the stream. Forty signs have been placed along this portion of East Fork Poplar Creek, effectively covering the residential areas of Oak Ridge. These postings warn against swimming, wading, and fishing.

The division in March 2002 conducted the annual sign posting inspection. Five of the 24 signs along Melton Hill Reservoir and 12 of the 38 signs along Watts Bar Reservoir were missing or defaced and needed appropriate remedies. Five of the 40 signs located along East Fork Poplar Creek were missing and required replacement.

4.4.5 Aquatic Life

During the spring of 2002, division personnel conducted oversight trips in conjunction with the annual ORNL BMAP fish and benthic macroinvertebrate sampling. The oversight trips determined that established scientific protocols were followed and no biased sampling was evident.

4.0 Oak Ridge Regional Environment

The division annually conducts an independent assessment of the benthic macroinvertebrate communities at the same stream locations as the BMAP study. From late April to late May, division personnel collected benthic macroinvertebrate samples for laboratory analysis, currently under way. Results will be published in the 2002 Environmental Monitoring Report. The results from the 2001 independent sampling event can be obtained from the 2001 division Environmental Monitoring Report, available at the division office or at <http://www.state.tn.us/environment/doeo/emr2001.pdf>.

4.4.6 White-Tailed Deer

The division's Environmental Monitoring and Compliance Program usually monitors the fall deer hunts on the ORR. The deer hunt was cancelled in 2001 due to security concerns, but was to resume in 2002. Deer hunting on the ORR began in 1985 in an attempt to control the large deer population. Since then 2% (165) of the 7,847 deer taken were retained due to contamination. The most prevalent contaminants found in the deer are cesium-137, a gamma emitter known to accumulate in body tissue, and strontium-90, a beta emitter known to accumulate in bone. External scans for radiation were performed by either ORNL or the division until 1996. These were discontinued because external contamination has not been found since the hunts began.

4.4.7 Canada Geese

Past studies conducted by ORNL personnel have shown that a small proportion of Canada Geese residing at ORNL may become contaminated. Consequently, an annual goose roundup is conducted at ORNL, locations near ETTP and Y-12, and other sites on the ORR. Geese are collected and scanned to determine if they are contaminated by radionuclides and other hazardous contaminants. Since 1991 this has been a cooperative project between the Tennessee Wildlife Resources Agency (TWRA), DOE, BMAP teams, and division staff.

The June 2002 goose roundup surveyed 182 geese, including 120 adults and 62 juveniles, from seven locations on and around the ORR. All geese received a unique leg band and adults received a neck collar if they did not already have one. Three individuals were sacrificed for tissue analysis and archiving. Of significance are the three juveniles captured at ORNL in the area of the sewage treatment plant; these three contained levels of cesium-137 above the DOE administrative control level of 5 pCi/g. Upon consultation with TWRA and ORNL personnel, it was determined that since the contaminated individuals were relatively small (by weight) and the levels of contamination were only slightly above the administrative level, in all likelihood they would "outgrow" the contamination. Therefore, these individuals were released back into the area of collection.

Due to the presence of these contaminated geese, the division initiated its independent monitoring plan to survey off-site populations for possible contamination. A total of 21 off-site geese from the Oak Ridge area were scanned for gamma contamination. None had levels of cesium-137 above that which would occur naturally.

4.0 Oak Ridge Regional Environment

4.4.8 Wild Turkey

Each year, two managed weekend hunts on the ORR are open to the public. In the five years since the managed turkey hunts began, only two turkeys have been retained due to radioactive contamination. Those turkeys were retained in 1997 and 2001 due to slightly elevated strontium readings. In this year's hunts, 38 turkeys were killed and none were retained. All were below the administrative release criteria of 20 pCi/g for bone tissue and 5 pCi/g for the whole body count

4.4.9 Threatened and Endangered Species

In support of the division of Natural Heritage, the division conducts surveys and evaluations for threatened and endangered species on the ORR. Division staff also review documents and assist the division of Natural Heritage as needed. The division keeps an inventory of those plant and animal species that are on the state and EPA lists for surveillance.



TDEC photo

A turkey undergoes a radiation count in the leg bone.

5.0 Key Challenges

This section summarizes key challenges facing DOE, the community, and the state.

5.1 DEVELOPMENT OF GROUNDWATER MANAGEMENT STRATEGIES

Groundwater contamination in Oak Ridge is an issue that is both difficult and complex. This complexity is illustrated by the various state, federal, contractor, and other stakeholder programs aimed at Oak Ridge groundwater. Regulations on Oak Ridge groundwater come from various places:

- The ORR's placement on the National Priorities List;
- DOE Orders;
- State and federal regulation on current operations;
- Cleanup of legacy sites; and
- CERCLA.

The ability to get reliable data has and continues to be a challenge in determining the extent of and how best to remediate groundwater contamination.

Groundwater challenges will have a substantial impact on decisions involved in long-term stewardship, institutional controls, land use planning and Natural Resource Damage Assessments.

5.2 LONG-TERM STEWARDSHIP RESPONSIBILITIES

Long-term risks to the public and the environment will remain unless there is active care and monitoring of remnant contamination.

Hazardous and radioactive contamination will remain on the ORR for many years, long after the cleanup program has come to a close. As a result, long-term risks to the public and the environment will remain unless there is active care and monitoring of remnant contamination. The state is requiring that DOE ensure adequate funding for this care, independent of annual appropriations from Congress.

If it is to be effective, long-term stewardship must also be accompanied by improvements in record keeping, enforcement, surveillance, maintenance, monitoring, and funding.

5.3 THE FEDERAL COMMITMENT

DOE, EPA Region 4, and the state have signed an Oak Ridge Accelerated Cleanup Plan Agreement. The agreement resolved an FFA dispute by providing enforceable milestones through FY 2005. The accelerated program will complete the closure of East Tennessee Technology Park, interim actions in Melton Valley to cap historic disposal

5.0 Key Challenges

sites and control the spread of contamination in the groundwater, and other high-risk projects on and off the ORR by 2008. The plan calls for disposal of all stored legacy waste from the Oak Ridge site by 2005 and CERCLA cleanup at Oak Ridge to be completed by 2016. If this plan is successful, it is estimated to reduce cost by over \$2 billion and accelerate completion of the Environmental Management Program by 5 years. To be successful, DOE must be committed to annual funding of the Environmental Management Program at levels sufficient to meet the agreed-to schedule.

5.4 CHARACTERIZATION OF OAK RIDGE RESERVATION WASTE

Disposal options for Oak Ridge waste increased significantly when the on-site CERCLA waste disposal facility opened and joined Envirocare of Utah and the Nevada Test site in receiving Oak Ridge wastes. It is imperative that all waste be sufficiently characterized to meet the certification requirements of any potential disposal site. The waste characterization is necessary to assure a clear path for disposal once the level of contamination has been determined.



TDEC photo

A division staff member checks for remaining contamination after cleanup of contaminated pavement at ORNL.

6.0 Health Studies & Emergency Response

6.1 HEALTH STUDIES

Concerns have been raised for years concerning contaminants from the ORR and health problems they may have caused for workers on-site and for nearby residents.

Several government agencies have moved to address these concerns, through energy-related research, health-related studies, and public health activities centered on the ORR. These activities have been conducted by the National Center for Environmental Health, the National Institute for Occupational Safety and Health, the Agency for Toxic Substances and Disease Registry (ATSDR), the Centers for Disease Control and Prevention (CDC), and the Tennessee Department of Health.

Health studies and assessments already conducted or ongoing in Oak Ridge are grouped into three main areas:

- Off-site contamination,
- Community health studies and activities, and
- Workers health studies.

6.1.1 Oak Ridge Reservation Health Effects Subcommittee

ATSDR and other CDC agencies have established an Oak Ridge Reservation Health Effects Subcommittee, made up of a representative and knowledgeable group from the Oak Ridge area. The subcommittee is a federal advisory committee that provides advice and recommendations to CDC and ATSDR about the agencies' public health activities and research at the ORR. The subcommittee works with private citizens, advocacy groups, state agencies, and other federal agencies in the region and provides communities an opportunity to communicate directly with national public health agencies.

Committee activities include assisting in a public health assessment that looks at nearby communities and identifies their possible exposures, both past and present, to radiological and chemical contaminants from the reservation. The assessment will evaluate data on sickness and death, identify people who have been exposed at levels high enough to be of concern, identify increased rates of related health problems, and, eventually, recommend public health actions to combat any adverse health effects of these exposures. The assessment will make use of data collected under the Oak Ridge Health Agreement Studies, which were conducted during the 1990s and published in January 2002.

6.0 Health Studies & Emergency Response

6.2 EMERGENCY RESPONSE

6.2.1 Tennessee Emergency Management Agency

The Tennessee Emergency Management Agency (TEMA) is the state's emergency management arm. Located within the Military Department of Tennessee, TEMA provides technical assistance, supplies, equipment, and training to local governments. The agency also administers funding from the state and federal governments.

TEMA operates a 24-hour emergency operations center. This center manages emergency information and coordinates state and federal assistance from one location.

Under the Tennessee Oversight Agreement, DOE is required to provide technical and financial assistance for emergency response. TEMA is the primary state agency responsible for implementing the following provisions:

- Developing and maintaining the state's Multi-Jurisdictional Emergency Response Plan for ORR facilities in accordance with federal laws and regulations;
- Organizing and participating in annual emergency response exercises and drills with affected state agencies and local governments;
- Training state and local government employees and officials, as well as volunteers who may be called upon in the event of an emergency at the ORR; and
- Acquiring and maintaining equipment—with funds provided by DOE—for TEMA and affected counties to support the Emergency Response Plan.

TEMA is responsible for emergency response planning and training, and the division actively participates in emergency response exercises on the ORR. The division, in coordination with TEMA, has developed a system to track occurrences sufficiently significant to be reported. Daily occurrence reports are sent to the division. The division is also in constant contact with TEMA through the use of a dedicated duty person and the use of a 24-hour paging system.

The division actively participates in emergency response exercises on the ORR.

A major accomplishment in June 2002 was finalization of the Tennessee Multi-Jurisdictional Emergency Response Plan for the Department of Energy by TEMA. This plan is shared with emergency response organizations in Anderson, Knox, Loudon, and Roane counties. The basic plan describes general concepts that guide the off-site response to emergency event at the ORR. The purpose, scope, execution of the plan, the state's mission, assignment of emergency

6.0 Health Studies & Emergency Response

responsibilities, and descriptions of the major emergency response organizations are provided. The Emergency Support Function sections describe specific off-site response action resulting from an emergency at the ORR. For each function, the lead and support agencies are assigned and concept-of-operations and responsibilities for the tasked agencies are defined. Site-specific information is provided in appendices.

6.2.2 TDEC DOE Oversight Division

The division plays a crucial role in emergency response operations on the ORR.

The division plays a crucial role in emergency response operations on the ORR. The division's primary responsibilities include the formation and staffing of field monitoring teams, the training of those teams, and operation of the Environmental Monitoring Control Center during exercises and actual emergency responses. The division also monitors and investigates—where warranted—incidents at DOE sites that may affect public health or the environment. A third major area of responsibility involves maintaining emergency readiness by participating in scenario planning for emergency response exercises and participation in those exercises

The division maintains constant contact with TEMA, DOE, and DOE contractors through a network of communications systems that include a mobile paging system, a computerized e-mail alert system, and routine fax transmissions. In the event of an actual emergency or during an exercise, additional modes of communication are activated that include the following:

- Cellular telephones,
- A computerized Emergency Management Information System,
- A radio network communication system, and
- A dedicated telephone ring-down system allowing instant communication with the State Emergency Operations Center in Nashville and the DOE Emergency Operations Center located at ETTP.

Division responders are mobilized for actual emergencies and during routine exercises. These TDEC staff members are responsible for operating the Environmental Monitoring Control Center and for coordinating and manning the field environmental monitoring teams that are sent to the affected area to assess potential environmental releases. Division field monitoring teams are trained and equipped to monitor for radiation and chemicals, and they are responsible for conducting multimedia (air, water, and soil) field sampling activities. These teams are dispatched from the Environmental Monitoring Control Center in Alcoa.

The division's Emergency Services Coordinator serves as the lead local environmental official for the State Field Coordination Center at TEMA East in Alcoa. Another

6.0 Health Studies & Emergency Response

division representative serves in the Joint Information Center during these activities at the Loudon County National Guard Armory in Lenoir City.

The division participates in several emergency response exercises annually, culminating with an annual full participation exercise involving all affected city, county, state, and federal agencies.

The division's Standard Operating Procedures are outlined in the TDEC DOE-Oversight Division Emergency Response Guide Book and Procedures Manual, available for review at the division's office.

There were no DOE emergencies that resulted in the off-site release of contamination during FY 2002.

7.0 Outreach

The division conducts public outreach at the local, state, and national levels. By attending public meetings to make presentations and act as an information resource, the division helps the public learn about the ORR's environment. The division's local and state activities are included under the Tennessee Oversight Agreement. Its national activities include membership in a variety of programs and initiatives. The division also maintains a World Wide Web site with detailed information about ORR environmental issues at <http://www.state.tn.us/environment/doeo>.

Other community organizations that monitor DOE activities in Oak Ridge also seek to include the public in their work. In addition, DOE has an extensive outreach program to solicit public input on environmental concerns, and the agency has established two information centers to give stakeholders direct access to relevant documents.

Outreach programs enable the public to play a meaningful role in environmental decision-making. Following are the major public outreach efforts undertaken by a variety of organizations concerned with DOE's environmental management program at Oak Ridge. Contacts for local and state initiatives—including addresses, phone and fax numbers, and web sites—are listed in the appendix.

7.1 OAK RIDGE RESERVATION LOCAL OVERSIGHT COMMITTEE

The Local Oversight Committee's mission is to ensure that the best interests of member communities are protected and that public funds are used wisely during cleanup.

Representatives of the division participate in meetings of the ORR Local Oversight Committee (LOC), an organization chartered under the Tennessee Oversight Agreement. The LOC's mission is to ensure that the best interests of member communities are protected and that public funds are used wisely during cleanup, continued operation, and reindustrialization at the ORR. The LOC is governed by a Board of Directors, which includes local elected and appointed officials from the City of Oak Ridge and the counties of Anderson, Roane, Knox, Loudon, Meigs, Rhea, and Morgan. Board members are concerned with human health and the environment, emergency management issues, and any impacts on their communities' economic and social well being.

The board is advised by a 20-member Citizens' Advisory Panel (CAP), which was created in early 1995 to provide advice based on in-depth reviews of DOE documents and studies of community

7.0 Outreach

concerns. CAP meetings often begin with presentations by experts on issues of current interest to the greater Oak Ridge community. CAP members attend meetings of other organizations concerned with environmental, economic, and health issues in order to better evaluate the range of stakeholder opinions. The CAP regularly transmits public concerns to the LOC Board, and also to DOE, EPA, and TDEC.

In the past year, issues addressed by the LOC and the CAP have included the following:

- The environmental management budget process and its implications for cleanup on the ORR;
- The findings of DOE's top-to-bottom review and the resulting accelerated cleanup plan for the ORR;
- The community's concerns regarding long-term stewardship of remediated sites;
- Historic preservation on the ORR and its appropriate integration with cleanup planning and activities;
- Capacity and use of the EMWMF for various cleanup wastes;
- Technical issues related to the decision-making process for remediation at the watershed level; and
- The roles and responsibilities of different entities and jurisdictions in emergency planning and response.

The LOC's outreach efforts include a periodic newsletter Insights, presentations to community groups and governmental entities, publication of informational white papers, and an Internet presence at <<http://www.local-oversight.org>>. The LOC is staffed by an executive director and an administrative assistant. For further information about the LOC or to be added to the newsletter mailing list, contact Susan Gawarecki in Oak Ridge by phone at (865) 483-1333, toll free at (888) 770-3073, or by e-mail at loc@icx.net.

7.2 TDEC DOE OVERSIGHT DIVISION NATIONAL ACTIVITIES

At the national level, division staff members participate in a wide range of initiatives that may affect the ORR, the Oak Ridge community, or the state. These initiatives include involvement in the following groups:

- The National Governors Association Federal Facilities Task Force;

7.0 Outreach

- The National Conference of State Legislatures' State and Tribal Government Working Group;
- The Environmental Research Institute of States, Interstate Technology Regulatory Cooperation, Radionuclide Work Group;
- The DOE/EPA Rapid Commercialization Initiative for Technology Demonstration;
- The Association of State and Territorial Solid Waste Management Officials Radiation Task Force; and
- The Tri-State (Tennessee, Kentucky and Ohio)/DOE Depleted Uranium Hexafluoride Working Group.

Division activities also include the following:

- Review of and comment on the National Governors Association Policy on Compliance at Federal Facilities;
- Review of and comment on DOE's Long-Term Stewardship Strategic Plan;
- Participation as Tennessee representative during DOE complex-wide integration discussions of waste management and nuclear materials management plans involving inter-site disposition;
- Presentation focusing on Tennessee policy and technical issues to EPA remedial program managers from all EPA regions, Washington, D.C.; and
- Publishing of papers in national journals about environmental planning and radiation safety.

7.3 LOCAL GOVERNMENT ENVIRONMENTAL BOARDS

7.3.1 Oak Ridge Environmental Quality Advisory Board

The Oak Ridge Environmental Quality Advisory Board (EQAB) is an official board of the City of Oak Ridge. Its members are appointed by the City Council, and the board, in turn, advises the City Council on environmental issues. Because the ORR is within the city limits of Oak Ridge, one of EQAB's primary functions is to review and comment on DOE cleanup activities that potentially affect the city. See the Appendix for contact information.

7.0 Outreach

7.3.2 Roane County Environmental Review Board

Members of this official Roane County governmental board are appointed by the county executive and confirmed by the County Commission. The board advises both the county executive and the commission on environmental matters, including those resulting from the presence of two major ORR facilities—ORNL and ETTP—in Roane County. Roane County continues to attract commercial waste management firms interested in doing business with DOE and outside clients. In addition, three incinerators on or near the ORR are situated within county boundaries. The east end of Roane County will have a variety of DOE-related cleanup, waste management, and transportation issues to monitor for years to come. Contact information is provided in the Appendix.

7.4 DOE OUTREACH

7.4.1 Oak Ridge Site Specific Advisory Board

Oak Ridge Site Specific Advisory Board (ORSSAB) is an advisory committee to DOE's environmental management organization and is chartered under the Federal Advisory Committee Act of 1972.

The board provides advice to DOE's Oak Ridge Environmental Management program both on policy issues and on specific decision documents. The board consists of up to 20 members from the greater Oak Ridge region who are concerned about environmental restoration and waste management. Representatives from TDEC, DOE, and EPA Region 4 attend meetings as non-voting members to act as a resource for information and to hear the concerns of the board. ORSSAB's standing committees are Environmental Restoration, Waste Management, and Stewardship, and it has an ad hoc committee addressing board process.

All board and committee meetings are open to the public and are announced in newspaper advertisements, in the Federal Register, at the DOE Information Center in Oak Ridge, and through the board's 24-hour information line at (865) 576-4750. Board meetings are recorded on video, and copies of the tapes are available for public review. ORSSAB produces a quarterly newsletter called "The Advocate," and its Web site is at <<http://www.oakridge.doe.gov/em/ssab>>. Information is also available by calling the ORSSAB support office (see Appendix).

7.4.2 Community Relations

DOE's Community Relations office produces two publications distributed to interested individuals. "Environmental Update" is a quarterly newsletter that explains environmental management activities and decisions either in progress or being contemplated in Oak Ridge. The monthly "Public Involvement News" summarizes upcoming public meetings, announcements, availability of documents, pending NEPA actions, and opportunities for public involvement. Individuals can be added to the Community Relations mailing list by contacting Walter Perry, manager of community relations for DOE's Oak

7.0 Outreach

Ridge Environmental Management program, at (865) 576-0885, or they can pick up a copy of either publication at the DOE Information Center (see Section 7.4.4 below).

Environmental management activities are also detailed on the Internet at <<http://www.oakridge.doe.gov/em>>. Links to documents and other information sources are also provided from this web site.

7.4.3 National Environmental Policy Act

NEPA requires federal agencies to provide public officials and citizens with environmental information for proposed federal actions that could affect environmental quality. This is accomplished through the preparation of one of two documents: an EIS if the proposed action will have a significant impact on environmental quality, or an EA if the impact is not significant. The EIS requires public involvement and access to information regarding DOE proposals. Formal public meetings are held in conjunction with the scoping and release of EISs, giving regulators and citizens an opportunity to comment openly on DOE's planned activities.

In 1994, DOE adopted a policy that combines the public involvement procedures of NEPA and CERCLA for major cleanup decisions. This policy states, "CERCLA documents will incorporate NEPA values, such as analysis of cumulative, off-site, ecological, and socioeconomic impacts, to the extent practicable." DOE's policy and announcements on pending NEPA actions are available on its web site at <<http://tis-nt.eh.doe.gov/nepa>>.

7.4.4 DOE Information Center

The DOE Information Center combines the administrative record formerly housed at the Information Resource Center and the documents stored at the former DOE Public Reading Room. The Information Center, located at 475 Oak Ridge Turnpike, is the official repository for all information and documents that support or compose the administrative record for the FFA. This includes such information as newspaper articles related to the ORR, official correspondence, and decision documents on site remediations. It is also the storage area for documents requested under the Freedom of Information Act, newly released or declassified files and information dealing with health issues, and documents covering all aspects of the ORR's environment not otherwise part of the administrative record.

These files are accessible to the public and may be read on the premises, or the staff will copy documents on request. The Information Center's phone number is (865) 241-4780.

Appendix

Local Government & Stakeholder Organizations

The Oak Ridge Reservation Local Oversight Committee, Inc.

102 Robertsville Road, Suite B
Oak Ridge, TN 37830
Phone: (865) 483-1333
Toll free: (888) 770-3073
Fax: (865) 482-6572
E-mail: loc@icx.net
Web site: <http://www.local-oversight.org>

City of Oak Ridge Environmental Quality Advisory Board

City of Oak Ridge, P.O. Box 1
Oak Ridge, TN 37831-0001
Phone: (865) 425-3554
Fax: (865) 425-3426
E-mail: EQAB@corn.org
Web Site: <http://www.corn.org/eqab/>

Roane County Environmental Review Board

Roane County Courthouse
P.O. Box 643
Kingston, TN 37763
Phone: (865) 576-4025
Fax: (865) 376-4318
E-mail: HalseyPJ@icx.net

Oak Ridge Site Specific Advisory Board

P.O. Box 2001, EM-90
Oak Ridge, TN 37831
Phone: (865) 241-3665
Fax: (865) 576-5333
E-mail: blacksl@oro.doe.gov
Web Site: <http://www.oakridge.doe.gov/em/ssab>

League of Women Voters of Oak Ridge

Margaret Beams, President
P.O. Box 4073
Oak Ridge, TN 37831-4073
Phone: (865) 482-6887
E-mail: lwvor@bellsouth.net
Web Site: <http://www.lwvor.org>

Community Reuse Organization of East Tennessee

107 Lea Way
P.O. Box 2110
Oak Ridge, TN 37831-2110
Phone (865) 482-9890
Fax (865) 482-9891
E-mail: younglt@croet.com
Web Site: <http://www.croet.com>

East Tennessee Environmental Business Association

P.O. Box 5483
Oak Ridge, TN 37831-5483
Phone: (865) 483-9979
Fax: (865) 481-8928
E-mail: jenny@eteba.org
Web Site: <http://www.eteba.org>

Atomic Trades and Labor Council

P.O. Box 4068
Oak Ridge, TN 37831-4068
(865) 483-8471

Paper, Allied-Industrial, Chemical, and Energy Workers International Union

133 Raleigh Road
Oak Ridge, TN 37830
Phone: (865) 483-3745
Fax: (865) 483-6460
E-mail: pace@icx.net
Web Site: <http://user.icx.net/~pace/>

Oak Ridge Reservation Health Effects Subcommittee

Bill Taylor
ATSDR Oak Ridge Field Office
197 S. Tulane Avenue
Oak Ridge, TN 37830
Phone: (865) 220-0295
E-mail: wxt4@cdc.gov

Appendix

Coalition for a Healthy Environment

Harry Williams, President
12410 Buttermilk Road
Knoxville, TN 37932
Phone: (865) 693-7249
Fax: (865) 531-6217
E-mail: harry.williams2@worldnet.att.net
Web Site: <http://www.che-or.org/>

Save Our Cumberland Mountains

P.O. Box 479
Lake City, TN 37769
Phone: (865) 426-9455
Fax: (865) 426-9289
E-mail: info@socm.org
Web Site: <http://www.socm.org>

Oak Ridge Environmental Justice Committee

100 Wiltshire Drive
Oak Ridge, TN 37830-4505
Phone/Fax: (865) 482-1559
E-mail: brooks@icx.net
Web site: <http://user.icx.net/~brooks/orejc.html>



TDEC photo

The waters of White Oak Lake are heavily contaminated by discharges from ORNL and waste disposal sites. The dam and lake are fenced and posted to prevent public access.

State Contacts

Tennessee Department of Environment and Conservation Department of Energy Oversight Division

761 Emory Valley Road
Oak Ridge, TN 37830
Phone: (865) 481-0995
Fax: (865) 482-1835
E-mail: John.Owsley@state.tn.us
Web site: <http://www.state.tn.us/environment/doeo>

John Owsley, Director

Dale Rector, Assistant Director

Bill Childres, Waste Management

Jim Harless, Environmental Monitoring and Compliance

Doug McCoy, Environmental Restoration

Charles Yard, Radiological Monitoring and Oversight

Tennessee Emergency Management Agency

Elgan Usrey, Assistant Director
3041 Sidco Drive
Nashville, TN 37204-1502
Phone: (615) 741-2879
Fax: (615) 242-9635
E-mail: eusrey@tnema.org
Web site: <http://www.tnema.org/>

Carl McDaniel, Emergency Management Area Coordinator (Anderson and Roane counties)
836 Louisville Road
Alcoa, TN 37701
Phone: (800) 533-7343 (in state)
Phone: (865) 981-2387
Fax: (865) 981-5610
E-mail: cmcdaniel@tnema.org

Albert Libbrecht, Emergency Management Area Coordinator (Knox and Loudon counties)
836 Louisville Road
Alcoa, TN 37701
Phone: (865) 981-5643
Fax: (865) 981-5610
E-mail: alibbrecht@tnema.org

Appendix

Tennessee Department of Environment and Conservation

DOE Oversight Division

761 Emory Valley Road

Oak Ridge, TN 37830

Phone (865) 481-0995

Fax (865) 482-1835

